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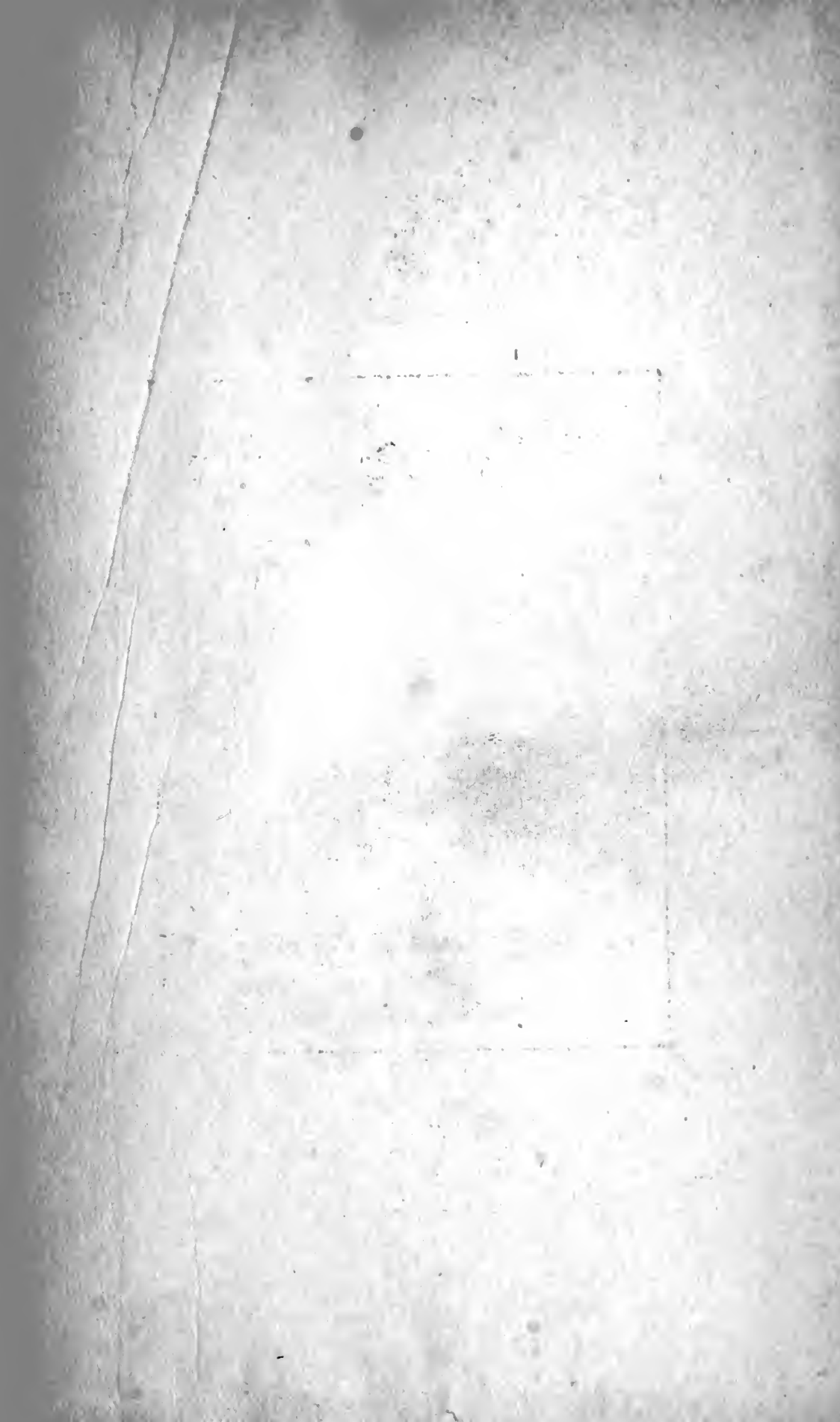
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DISEASES OF THE GALL-BLADDER  
AND BILE-DUCTS



*9/44 J. H. Sandhu*  
DISEASES

OF

THE GALL-BLADDER AND  
BILE-DUCTS,  
INCLUDING GALL-STONES

BY

A. W. MAYO ROBSON, F.R.C.S.

HUNTERIAN PROFESSOR OF SURGERY AND PATHOLOGY, 1897, 1899, AND 1903; AND VICE-  
PRESIDENT, ROYAL COLLEGE OF SURGEONS OF ENGLAND, 1902

ASSISTED BY

J. F. DOBSON, M.S. (LOND.), F.R.C.S.

LATELY RESIDENT SURGEON TO THE GENERAL INFIRMARY AT LEEDS

THIRD EDITION

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## PREFACE TO THIRD EDITION

SINCE the issue of the second edition, so much progress has occurred in the pathology of the diseases of the gall-bladder and bile-ducts, and such improvements in the technique of the various operations, that the whole book has had to be recast.

This edition is therefore not merely a reproduction of the last, but almost a new work.

Besides an entirely revised chapter on the Operative Technique of Gall-stones, it will be found that several new chapters have been added, many additional cases furnished, and the whole of the work has been brought up to date.

In an appendix at the end of the volume will be found a more or less brief account of all the operations I have performed on the gall-bladder and bile-ducts, 539 in number, and an analysis will show how much more serious have been the later series of cases.

The large number of choledochotomies for stones in the common duct and of operations for pancreatic disease will at once attract notice.

Where so many different conditions have to be taken into consideration it is difficult to give a satisfactory classification of the cases operated on, but I hope the following account of the principal operations will give some idea of the results that have been obtained.

Where the operation of cholecystotomy has been undertaken for simple diseases, such as gall-stones, in the absence of cancer and jaundice with suppurative or infective cholangitis, the mortality has only been 1·06 per cent.

If the complicated cases, such as phlegmonous cholecystitis, gangrene of the gall-bladder, suppurative and infective cholangitis (all of which are classified by Kehr as complicated cases) be included, the mortality has been 2·7 per cent.

If the cases where cholecystotomy has been performed in the presence of cancer of the pancreas or bile-ducts be included, the mortality of the whole series has been 5·8 per cent.

Where cholecystectomy has been performed for diseases other than malignant, the mortality has been 6·2 per cent.; but where the cancer cases are included, it has been 14·3 per cent.

The operation of choledochotomy for removal of gall-stones from the common duct, which up to July, 1901, showed a mortality of 16·2 per cent., has since that date, under the more complete exposure which can now be obtained, shown a mortality of only 1·9 per cent.; and I have done a consecutive series of over fifty cases of choledochotomy and duodeno-choledochotomy without a death.

Cholecystenterostomy, in simple as distinguished from malignant diseases, has given a mortality of 5·5 per cent., but when performed for cancer of the pancreas or other forms of malignant growth the mortality has been so considerable—six out of eight cases—as to lead me to discontinue the operation where cancer can be positively diagnosed.

Cases of perforation of the bile-ducts, of intestinal obstruction caused by gall-stones, of hydatid disease setting up cholangitis, and of disabling adhesions, will be found in the appendix, where also will be found accounts of exploratory and other operations, which I hope may prove of interest to those engaged in the treatment of similar cases.

I have to thank Mr. J. F. Dobson for his assistance in looking through the notes of my cases, as well as for his help in the additions that have been made to the text.

A. W. MAYO ROBSON.

8, PARK CRESCENT, LONDON, W.,

*December, 1903.*

## PREFACE TO SECOND EDITION

ALTHOUGH the first issue of my lectures on 'Diseases of the Gall-bladder and Bile-ducts' was taken up within a few weeks, want of leisure prevented me from preparing a second edition, since it involved a recasting of the whole book, and changing it from the lecture to the narrative form.

Had it not been for the kind help of my friend Dr. Macrae, who has assisted me in my operative work during the past two years, the issue must have been further delayed.

It will be found that, besides new chapters on Membranous Cholecystitis and on Gall-stones, and an index, many additions have been made to the text, and that my further operative experience, amounting to 135 cases, making in all 305 operations, has been included.

Instead of arranging the cases at the end of the volume, they have been classified, and placed at the end of the sections referring to the operations under consideration (the numbers preceding the cases having reference to the order of operation), which has seemed to me and my co-editor a more convenient method than the one pursued in the first edition.

An analysis of the operations will show that far more serious cases have been operated on in the later series. This

is especially shown in the operation for gall-stones impacted in the common duct, as well as in the cholecystotomies. In the latter list, it will be found that the mortality in cholecystotomy for gall-stones uncomplicated with deep jaundice, infective cholangitis, or cancer, is 1·1 per cent., while even including the malignant cases it is only 4·76 per cent.

I would take this opportunity of thanking my House Surgeon, Mr. J. Williamson, for the two additional drawings on pp. 147 and 148.

A. W. M. R.

7, PARK SQUARE, LEEDS,  
*February, 1900.*



## PREFACE TO FIRST EDITION

THE present volume is a reproduction of the lectures which, as Hunterian Professor, I had the honour of delivering at the Royal College of Surgeons of England in 1897. The views enunciated are the results of many years of observation on a class of cases to which until lately too little attention had been paid.

Thanks to my medical colleagues on the staff of the General Infirmary at Leeds, and to my many medical friends, I have had the opportunity of seeing a very considerable number of cases of the diseases in question, and of operating on those where surgical interference was required. Perhaps not the least useful part of the work is the synopsis of a consecutive series of operations performed on the gall-bladder and bile-ducts, which, for convenience of reference, I have had placed in a tabulated form at the end of the volume.

I am fortunately able to state that I have never lost a single patient after any operation for gall-stones in the absence of malignant disease, deep jaundice, or infective cholangitis, and it will be found, on reference to the list, that cholecystotomy for gall-stones, even including the infective cholangitis and deeply-jaundiced cases, only shows a mortality of 1·7 per cent.

I feel, therefore, in advancing the proposition 'that as soon as gall-stones give serious trouble their removal by operation is the most rational method of treatment,' it is one that can be safely supported, since it is only from the complications, which in many cases of cholelithiasis arise

sooner or later, that any danger after operation need be apprehended.

I must not fail to thank most sincerely the pathological curators of the Hunterian and of the various London Medical School Museums for their unfailing courtesy and kindness in giving me every facility for the study of the valuable specimens under their care, and the pathological committees of the various schools for their kindness in allowing me to show the original specimens at the college on the occasion of my lectures, and to have them photographed to illustrate the present volume.

My thanks are due to my friend and late assistant, Dr. H. Colligan Donald, for making a synopsis of and arranging my cases; to Dr. F. Gairdner and Dr. Morton, for their assistance with the diagrams; to Mr. Godart, for the excellent photographs of the specimens; and last, though not least, to my most obliging publisher, Mr. A. A. Tindall, for his courtesy and help in illustrating and in publishing the work.

A. W. M. R.

7, PARK SQUARE, LEEDS,

*June, 1897.*

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# DISEASES OF THE GALL-BLADDER AND BILE-DUCTS

## CHAPTER I

### **ANATOMICAL CONSIDERATIONS**

THE gall-bladder is situated on the inferior surface of the right lobe of the liver in a large but shallow depression termed the cystic fossa, the peritoneum covering the under surface of the liver being reflected on to and covering the unattached fundus and inferior surface.

The gall-bladder is usually pear-shaped, the large extremity lying anterior to and below the neck, where it merges in the cystic duct. It varies considerably in size according to the volume of its contents. In a state of moderate distension it holds from 50 to 60 c.c. of bile. Its walls are very elastic, and it is possible to introduce under pressure from 200 to 250 c.c. of water without producing rupture. If the distension is continued, rupture occurs close to the neck of the organ.

The gall-bladder is divided into three portions, the fundus, the body, and the neck, the latter being continuous with the cystic duct.

The rounded fundus projects beyond the free border of the liver, the margin of which presents a more or less distinct notch—the cystic notch—and comes into contact with the anterior abdominal wall close to the anterior extremity of the ninth or tenth costal cartilage. Practically, the fundus of the gall-bladder lies immediately below the

point where the outer edge of the rectus abdominis muscle crosses the costal margin.

The body of the gall-bladder presents two aspects, a superior and an inferior. The superior surface is in contact with the cystic fossa, to which it is united by some loose connective tissue and by vessels passing between the gall-bladder and the liver.



FIG. 1.—GALL-BLADDER AND BILE-DUCTS.

The lower surface is covered by peritoneum in its whole extent. It lies in contact with the second part of the duodenum and with the transverse colon. Its relations, however, vary considerably according to the state of distension of the organ. It may be pushed upwards and lie in contact with the first part of the duodenum, with the pylorus, or with the anterior surface of the stomach ; or it may be

displaced downwards and lie in contact with the ascending colon or the anterior surface of the right kidney. Occasionally a fold of peritoneum connects the body of the gall-bladder to the anterior aspect of the transverse colon.

The neck of the gall-bladder is the narrowest part of the organ. It is bent into the shape of the letter S, and main-

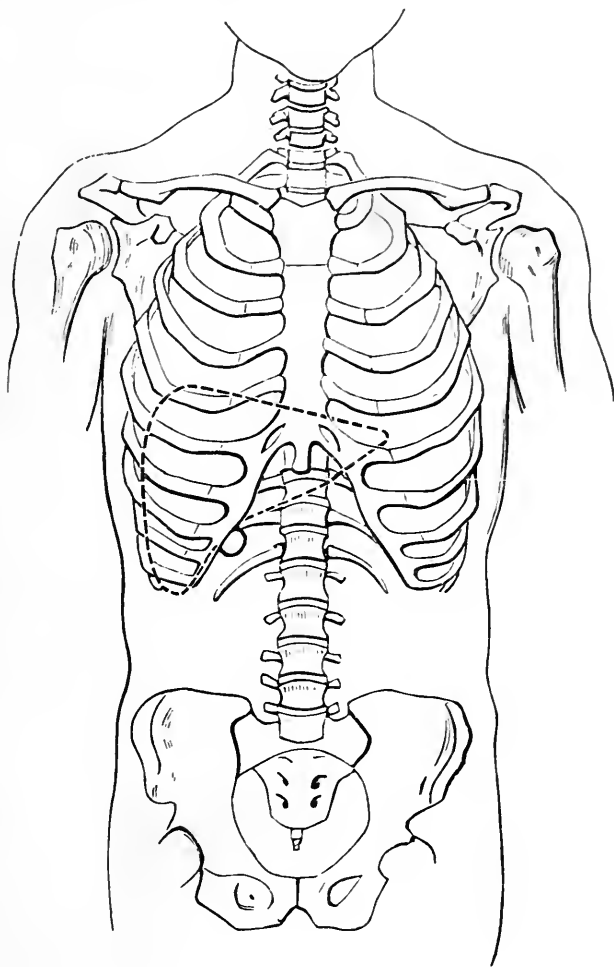


FIG. 2.-- DIAGRAM SHOWING RELATION OF GALL-BLADDER TO SURFACE.

tained in this position by loose connective tissue and by the peritoneum which covers it. Internally, two inflections give rise to the formation of two valves of mucous membrane, the lower of which separates the gall-bladder from the cystic duct.

The wall of the gall-bladder is composed of three layers, a serous coat, a fibro-muscular coat, and a mucous membrane.

The serous covering is continuous with the peritoneum covering the under surface of the liver. It covers all that portion of the gall-bladder which is not in contact with the cystic fossa. The fundus of the gall-bladder is completely covered by peritoneum, and its upper surface, unlike the body of the organ, is not in direct contact with the surface of the liver. It is separated by a double serous fold, the angle of which is formed by the reflection of the peritoneum from the margin of the liver on to the fundus of the gall-bladder.

Occasionally the gall-bladder is completely invested by peritoneum, there being on the upper aspect a distinct mesentery, which allows more or less free movement. This condition is, in my experience, both on the operating-table and in the dissecting-room, an extremely rare one, but Dr. Brewer (*'Annals of Surgery,'* June, 1899) estimates it as occurring in 50 per cent. of all cases. In 3 cases out of 100 examined by Dr. Brewer, a mesentery was formed on the lower surface by an extension outwards of the free border of the lesser omentum to the fundus, a condition also described by the late Mr. Greig Smith. A much more common condition found on the operating-table is the presence of a mesentery, not reaching the fundus, but extending to the lower third or half of the gall-bladder.

The fibro-muscular coat is composed of fibrous tissue, with an internal covering of irregularly disposed muscular tissue, the fibres of which run, some transversely, some longitudinally, and some obliquely.

The mucous membrane covers the whole of the internal aspect of the gall-bladder, and is continuous at the neck of the organ with the mucous membrane lining the cystic duct. When the organ is empty it is thrown into numerous folds, which become effaced on distension. In addition to the temporary folds there are permanent ridges, which divide the mucous membrane into triangular, quadrangular, or polygonal areas. It possesses a fibrous and an epithelial stratum, the latter being formed by a single layer of cylindrical cells.

The mucous membrane of the gall-bladder is richly studded with glands resembling those found in the biliary ducts.

They are lined with cells similar in every respect to those of the intervening mucous membrane, and secrete mucus.

Obstruction of the cystic duct, while it probably, to a certain extent, interferes with this function, does not entirely do away with it; hence in mechanical obstruction it is common to have the gall-bladder distended to a varying extent with clear, translucent, glairy fluid. The usual capacity of the cyst is said to be about 6 drachms, but it is not infrequently distended so as to hold over a pint of fluid, while several cases are on record of tumours due to dilated gall-bladders reaching such dimensions as to have been operated on by surgeons under the impression that they were ordinary ovarian tumours. When moderately distended, it is usually to be felt in the direction of a line drawn from the ninth or tenth costal cartilage and passing somewhat to the right of the umbilicus; but this position may be altered from an unusual size of the left lobe, or other structural variations of the liver, so that it may even project into the right lumbar region. On the other hand, especially where there have been repeated attacks of gall-stone colic extending over a long period, it is more usual to find the gall-bladder smaller than normal, and occupying a position just in front of the transverse fissure of the liver. So far may this contraction go that there may be almost complete obliteration of the sac, a condition which, when extreme, may be described as *cholecystitis obliterans*. In these cases there is not infrequently increased difficulty in recognising the true relation of the parts, from the adhesions of some of the surrounding organs by more or less intimate bonds to the gall-bladder and liver, so as completely to hide the gall-bladder from view when the peritoneal cavity is opened.

With cirrhosis of the liver the gall-bladder is carried up well under the ribs, while, if the liver is enlarged from any cause or displaced downwards by emphysema of the lungs, the gall-bladder will be pushed to a lower level. We have seen it in the *cæcal* region and even in the pelvis.

Similarly, in diseased conditions considerable variations occur in the size and relation of the ducts. It is not at all unusual for the common duct to be sufficiently dilated to

permit a gall-stone half an inch or more in diameter to 'float' in it, and stones quite as large as that have been at times extracted from the cystic duct. More rarely the hepatic duct also is enlarged sufficiently to admit the finger. In a few cases there has been noted congenital absence of the gall-bladder, and in these the hepatic duct and its subdivisions in the liver have been found dilated.

The blood-supply of the gall-bladder is derived from the cystic artery, a branch of the right division of the hepatic artery. This vessel runs by the side of the cystic duct to the neck of the gall-bladder, and there divides into two branches, an internal and an external, which run on either side of the viscus to the fundus. In addition, the gall-bladder receives some very fine branches, which come directly from the liver.

The cystic veins enter the right branch of the portal vein. The nerve-supply is derived from the coeliac plexus of the sympathetic.

The **cystic duct** extends from the gall-bladder to the termination of the hepatic duct, with which it unites to form the common bile-duct. It is from 33 to 45 millimetres in length, and has a diameter of from 3 to 4 millimetres, being narrowest at the point where it joins the hepatic duct. It resembles in structure the wall of the gall-bladder, and presents a convoluted appearance, owing to the infolding of the mucous membrane in the form of valves in the interior (Fig. 3).

The **hepatic duct** originates at the right extremity of the transverse fissure of the liver by the junction of the two or three terminal biliary ducts. Thence it runs downwards and a little from right to left, to terminate in the common bile-duct. The diameter of the duct measures from 4 to 5 millimetres. Its length is at least 3 centimetres, but it varies considerably in different subjects. These variations depend on one or other of the two following conditions: the uncertain point of junction of the terminal biliary ducts, and the high or low union of the cystic duct.

Very rarely the terminal biliary ducts, two or three in number, unite directly with the cystic duct to form the common bile-duct. In such a case the hepatic duct does not exist. In its whole course the hepatic duct is situated

between the two layers of the gastro-hepatic omentum. Above, at its origin, it crosses perpendicularly on their anterior aspect the right branches of the hepatic artery and the portal vein. Below, it runs on the antero-external aspect of the portal vein, which position it maintains to its termination. It is in intimate relationship with the lymphatic glands at the hilum of the liver, and also with the nerves running to the liver.

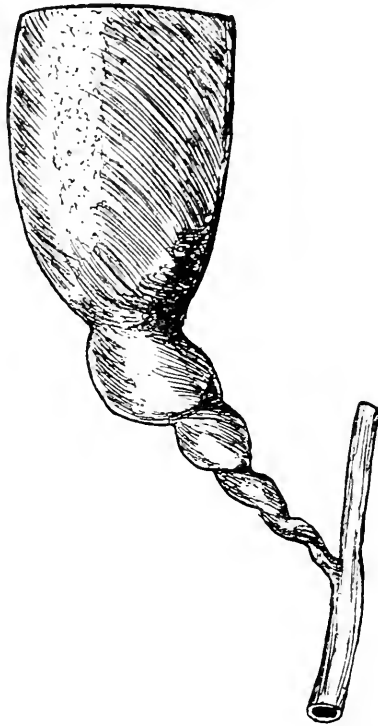


FIG. 3.—DIAGRAM TO SHOW CONVOLUTED APPEARANCE OF CYSTIC DUCT.  
(Modified from Testut.)

The wall of the hepatic duct is composed of two layers, an external and an internal.

The *external* is formed of connective-tissue and elastic fibres, with a few longitudinally disposed unstripped muscular fibres.

The *internal* is composed of mucous membrane lined with finely granular cells. The mucous membrane shows a number of small lateral diverticula, which correspond exactly to those found in the intra-hepatic ducts.

The blood-supply and innervation of the hepatic duct are the same as those of the common duct. The arteries are branches of the hepatic artery. The veins join the portal

vein. The lymphatics run to the glands in the hilum of the liver, and the nerve-supply is from the hepatic plexus.

The **common bile-duct** results from the junction of the cystic duct with the hepatic duct; it receives the bile from these two canals, and transmits it into the second portion of the duodenum. It runs in a direction continuous with that of the hepatic duct from above downwards a little from right to left, running behind the first part of the duodenum to the upper border of the head of the pancreas. Then it turns a

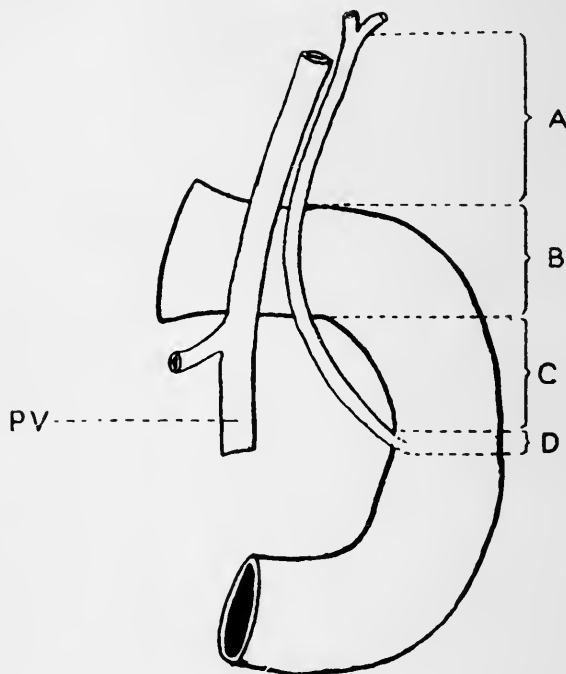


FIG. 4.—DIAGRAM OF COMMON BILE-DUCT.  
(Modified from Testut.)

little to the right and forwards within the pancreas to the postero-internal aspect of the second portion of the duodenum. It traverses the wall of the intestine, into which it opens.

It may be divided into four parts (Fig. 4):

1. The supraduodenal.
2. The retroduodenal.
3. The pancreatic.
4. The intraparietal.

The canal in its entirety describes a curve with the concavity to the right. It varies in length from 6 to 8 centi-



metres, while its diameter is a little greater than that of the hepatic duct. According to Quenu, an average taken from twenty subjects gives the circumference of the duct as 13 millimetres. The common duct is very extensile, as are also the other biliary ducts, and in cases of calculus and malignant obstruction the common duct may attain a very considerable size, so as to resemble in calibre the small or even the large intestine.

The relations of the common bile-duct are of extreme importance in view of the various operations which are performed for the relief of obstruction in the duct.

The *supraduodenal* portion measures from 10 to 14 millimetres in length, though it may be shorter or longer, according to the point of junction of the hepatic and cystic ducts. It runs in the free border of the gastro-hepatic omentum immediately in front of the foramen of Winslow. Here it lies on the antero-external aspect of the portal vein, while the hepatic artery is to its inner side. A small branch of the pancreatico-duodenal artery crosses this part of the duct just above the duodenum. A chain of three or four lymphatic glands lies in contact with the supraduodenal portion of the common bile-duct, their vessels passing to the glands in the transverse fissure of the liver.

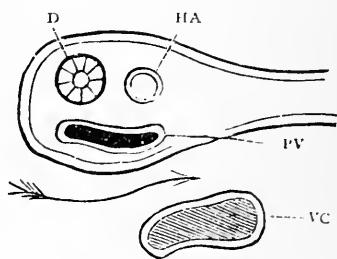


FIG. 5.—SECTION OF THE FREE BORDER OF THE LESSER OMENTUM, SHOWING THE RELATIONS OF THE COMMON BILE-DUCT.

HA, Hepatic artery; D, bile-duct; PV, portal vein; VC, vena cava. The arrow indicates the foramen of Winslow.

The *retroduodenal* portion corresponds to the posterior aspect of the first part of the duodenum, to the wall of which it is closely applied. The portal vein lies to its inner side, while behind it is the inferior vena cava.

The *pancreatic* portion is the name applied to that portion of the common bile-duct which extends from the inferior border of the first part of the duodenum to the point where the duct penetrates the wall of the second part; it measures from 20 to 25 millimetres in length. This portion of the common duct crosses a small quadrilateral area, bounded above by the inferior border of the first part of the duodenum,

below by the superior border of the third part, externally by the internal border of the second part, and internally by the superior mesenteric vein (Quenu, *Revue de Chirurgie*, 1895). It is here closely applied to the pancreas, in some cases being completely surrounded by pancreatic tissue, in others lying in a pronounced groove on the posterior surface of the gland.

Bunger (*Med. Press*, p. 523, 1902), in a careful examination of fifty-eight subjects, found in 25 per cent. the duct ran in a groove in the gland, while in 75 per cent. it was completely enclosed by pancreatic tissue.

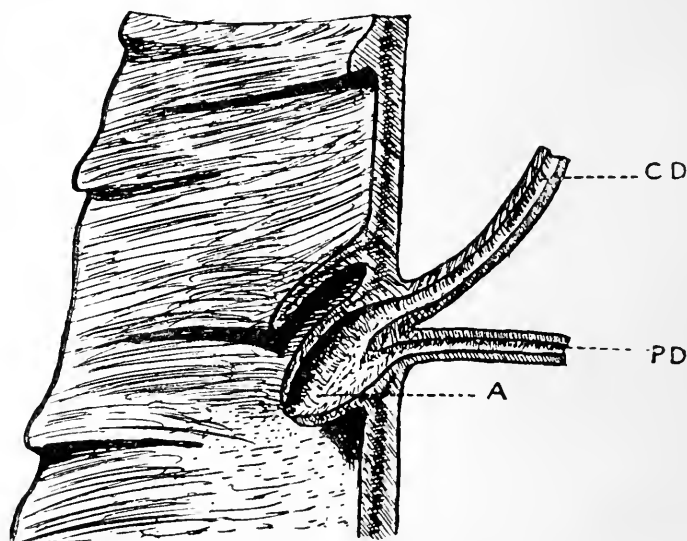


FIG. 6.—DIAGRAM TO SHOW THE AMPULLA OF VATER WITH THE ORDINARY TERMINATION OF THE COMMON BILE-DUCT AND THE DUCT OF WIRSWUNG.

(Modified from Testut.)

According to O. Wyss, the common bile-duct ran in a groove on the posterior surface of the head of the pancreas in fifteen out of twenty-two bodies examined (68·1 per cent.), and it was surrounded by the tissue of the pancreas on all sides in the other seven bodies (31·7 per cent.). This anatomical condition is important, inasmuch as swelling of the pancreas will in the first case push the common duct out of the way without compressing it, while in the second case compression leading to occlusion may easily take place where the duct passes through the head of the pancreas.

This portion of the common duct is in close relationship with the inferior vena cava.

The *intraparietal or interstitial portion* of the common duct comprises all that portion of the canal contained in the thickness of the wall of the duodenum. It passes obliquely through the muscular coat of the intestine, and then dilates into a little reservoir underneath the mucous membrane, into which the main pancreatic duct also opens. This is known as the ampulla of Vater. This ampulla, a little oval cavity, may be well seen in a section of the wall of the duodenum in the axis of the common duct (Fig. 6). The opening of the common duct is above that of the pancreatic duct, and the two are separated by a little transverse fold of mucous membrane. The ampulla measures from 6 to 7 millimetres in length, and from 4 to 5 in breadth, and, with the termination of the two ducts, is surrounded by a thin layer of unstriated muscular tissue, forming a sphincter (Oddi). The ampulla opens into the duodenum by a little round or elliptical orifice, which is the narrowest part of the bile channel. It is important to note that the length of the diverticulum of Vater may vary from zero to 11 millimetres, the average being 3·9 millimetres, according to Opie, who measured 100 specimens. Viewed from the interior of the duodenum the ampulla forms a rounded eminence of the mucous membrane, known as the *caruncula major* of Santorini, the opening being seen at the apex of the caruncle. It is distant 8 to 12 centimetres from the pylorus. Above it there is constantly found a small transverse fold of mucous membrane, which must be raised in order that the caruncle and its orifice may be clearly seen. Running downwards from the caruncle is a small vertical fold of mucous membrane known as the *frenum carunculæ*. Above the *caruncula major* is found a smaller eminence, the *caruncula minor*, marking the termination of the accessory pancreatic duct.

An accessory pancreatic duct or duct of Santorini opens into the duodenum about  $\frac{3}{4}$  of an inch above the biliary papilla; it is patent in about 50 per cent. of cases, and in over 80 per cent. of cases it communicates with the duct of Wirsung.

The mode of formation of the ampulla of Vater and the termination of the common and pancreatic ducts are liable

to great variations. Letulle and Nattan Lorrier distinguish four types.

The **first type** is the classical one described above.

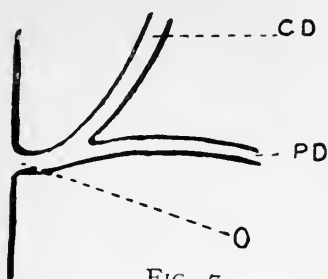


FIG. 7.

In the **second type** the pancreatic duct joins the common duct some little distance from the duodenum; the ampulla of Vater is absent, and the duct opens into the duodenum by a small flat, oval orifice (Fig. 7).

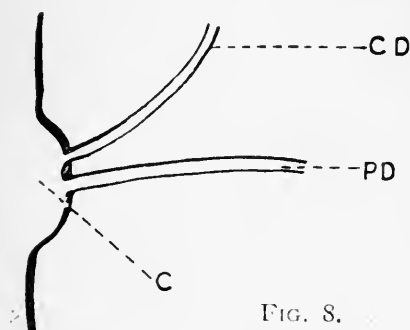


FIG. 8.

In the **third type** the two ducts open into a small fossa in the wall of the duodenum, while the caruncle and the ampulla of Vater are both absent (Fig. 8).

In the **fourth type** the caruncle is well developed, but the ampulla of Vater is absent, the two ducts opening side by side at the apex of the caruncle (Fig. 9).

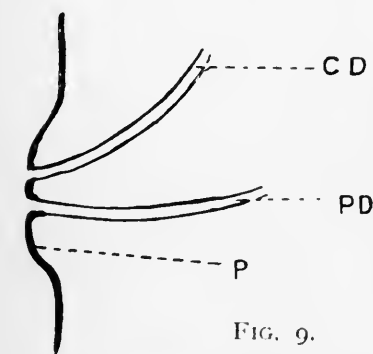


FIG. 9.

In structure the common duct resembles the other biliary ducts, its blood-supply and innervation being the same as those of the hepatic duct.

**Congenital Malformations.**—There is apparently no part of the biliary apparatus, except the liver, which may not be absent. While this is not to be wondered at in the case of the gall-bladder and cystic duct—as in Specimen No. 1,390 in Guy's Museum (see Fig. 24, p. 75), in one specimen in St. Thomas's, in two at the museum of the Middlesex Hospital, and in Specimen

#### THREE OTHER TYPES OF TERMINATION OF THE COMMON BILE-DUCT.

CD, Common bile-duct; PD, pancreatic duct; O, common orifice; C, cup-shaped depression in wall of duodenum; P, papilla.

No. 1,391 in Royal College of Surgeons' Museum (see Fig. 25, p. 75)—since they are normally wanting in certain animals and are frequently obliterated by disease in the human subject, it affords serious food for thought to find that life

has been possible for six months where even the hepatic and common ducts are represented by mere fibrous cords, as in Specimen No. 973 in St. Mary's (see Fig. 22, p. 68), and No. 1,017 in King's College Museums. The subject is treated of in a separate chapter (p. 66) as Obliterative Cholangitis.

Hourglass-shaped gall-bladder is probably not uncommon. I have operated on several.

Occasionally the distal part of the gall-bladder contains calculi, and communicates by a narrow neck with the cyst proper, or the distal portion may simply contain mucus and the proximal sac one or more calculi.

In some instances the condition arises from contraction of an old ulcer, but in others (as in Case 90), the mucous membrane being smooth, and showing no evidence of cicatrization, the deformity appears to have been congenital. Dr. Pilcher has described a case belonging to the latter category, and another has been published by Dr. H. C. Donald, of Paisley, in which the gall-bladder was found to be 'thickened and contracted, being firmly adherent to, and tucked up to, the under surface of the liver. It was distinctly hourglass in character, and contained thick, clear, and glairy mucus. Two calculi were removed from the proximal part of the gall-bladder, which was separated from the distal by a narrow neck, the calibre of which would admit a long probe, such as is used in exploring the ducts. He adds: 'I cannot advance an opinion as to whether this condition of gall-bladder was congenital or due to ulceration.'

A curious malformation is seen in Specimen No. 1,391 in Guy's Museum, in which the gall-bladder is dilated and turned to the left, forming an ovoid tumour 3 inches long, parallel with and projecting beyond the anterior edge of the liver.

The accompanying drawing (Fig. 10) is taken from a specimen of bifid gall-bladder of a sheep presented to me by Dr. Beatson of Glasgow, but the condition is only rarely seen in the human subject.

In the *Annals of Surgery* for May, 1899, is related a case in which there was transposition of viscera; and as the patient

was the subject of gall-stones, cholecystotomy was successfully performed on the left side.

In palpating the common duct for gall-stones, the surgeon frequently feels several more or less hard nodules within the free border of the lesser omentum, by the side or in front of the common duct, and unless it be borne in mind that three or four lymphatic glands normally exist here, they may be apt to mislead, especially as they are not unusually considerably enlarged where there is gall-stone irritation. Frequently they are as large as beans, and at times the size of filberts.

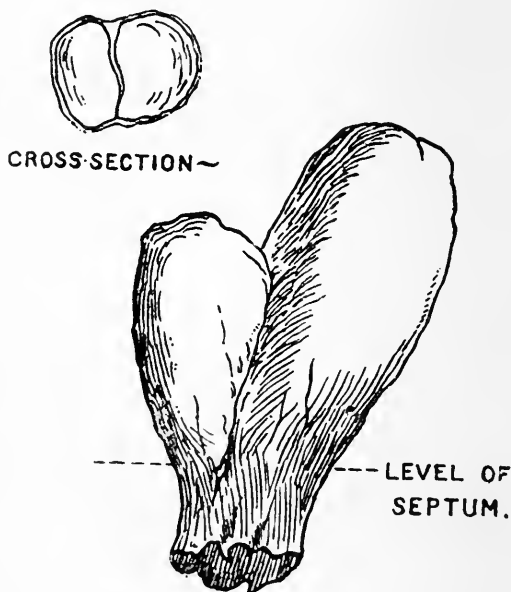


FIG. 10.—BIFID GALL-BLADDER FROM A SHEEP.  
(Leeds Museum.)

No. 2,809, Hunterian Museum, shows these glands much enlarged and melanotic (Fig. 11).

The large peritoneal pouch, bounded above by the right lobe of the liver, below by the ascending layer of the transverse mesocolon covering the duodenum internally, externally by the peritoneum lining the parietes down to the crest of the ilium, posteriorly by the ascending mesocolon covering the kidney, and internally by the peritoneum covering the spine, has been long recognised, but perhaps not sufficiently appreciated in gall-bladder surgery. Mr. Rutherford Morison

PLATE I.



FIG. II.—MELANOTIC TUMOUR OF GALL-BLADDER AND GLANDS  
IN PORTAL FISSURE.

(No. 2,809, Hunterian Museum.)

*To face p. 14.]*





drew attention to it in a paper in the *British Medical Journal* for March 3, 1894 (see Fig. 68, p. 292).

It is possible to drain this pouch satisfactorily by means of a long glass tube, but it is probably safer, on the whole, to make use of a lumbar drain. The author referred to, places such reliance on the ease and safety with which it can be drained that he does not advocate much time being spent in suturing incisions in the gall-bladder or bile-ducts. It is interesting to note that the pouch is capable of holding nearly a pint of fluid before it overflows into the general peritoneal cavity through the foramen of Winslow or over the pelvic brim.

A deformity of the liver, congenital or acquired, may at times lead to a difficulty in diagnosis or in treatment. The common form is a tongue-shaped prolongation of the right lobe, which may project below the costal margin for several inches, and simulate a tumour of the liver or an enlarged gall-bladder.

One form of the enlargement shown in Cruveilhier's Atlas is supposed to have been due to tight-lacing ; it was associated with dropsy of the gall-bladder and gall-stones.

In some instances the gall-bladder projects beyond the apex of the linguiform projection, in others the dilated gall-bladder lies under cover of the projecting lobe, which is thinned and spread out over it.

In Case 234 the gall-bladder and linguiform process of the liver reached the cæcal region, and the recurrent attacks of pain, associated with local peritonitis and unaccompanied by jaundice, much resembled recurring appendicitis, the point of greatest tenderness being situated midway between the umbilicus and anterior superior spine of the ilium, in which position the incision for the operation was made.

In others, the projection is external to the gall-bladder, which is then found lying on its inner side (Figs. 12 and 13).

In a case of this kind, where the gall-bladder is contracted and calculi are impacted in the cystic duct, there may be the greatest difficulty in extracting them, owing to a limitation of the space for manipulation, caused by the abnormality, unless the liver be lifted up as described on p. 250.

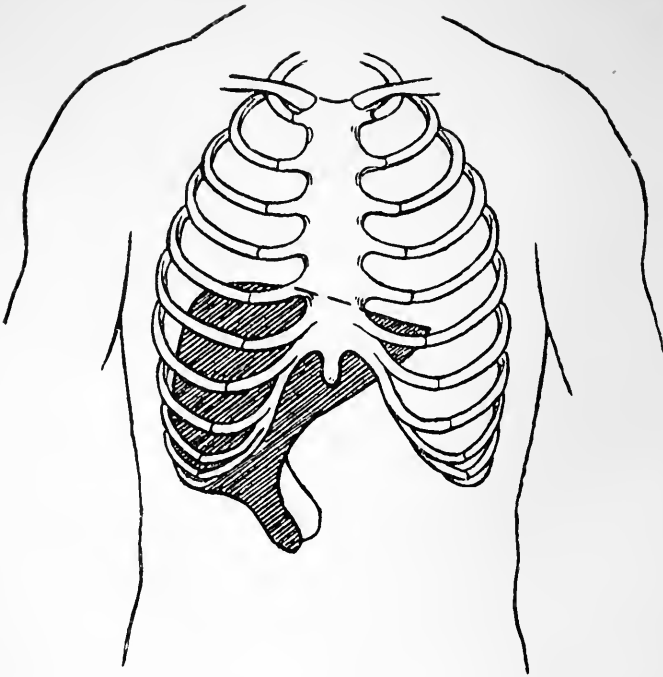


FIG. 12.—LINGUIFORM PROCESS OF LIVER.

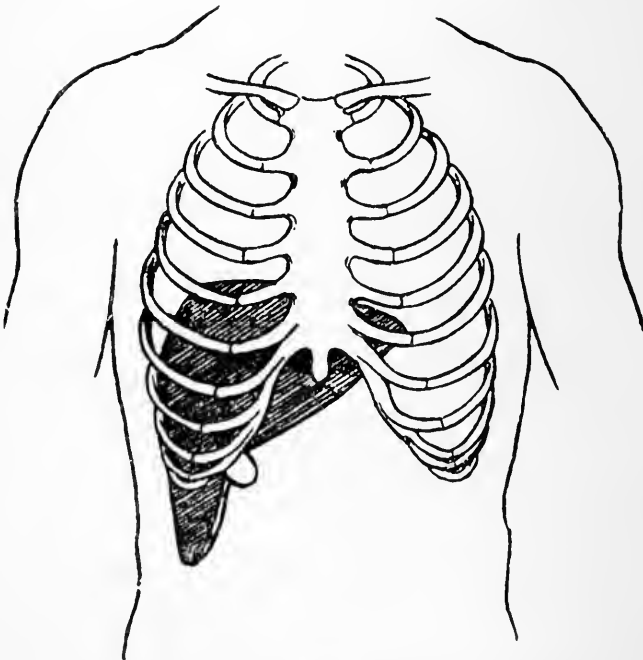


FIG. 13.—LINGUIFORM PROCESS OF LIVER.

We believe that Professor Riedel first described this linguiform projection of the liver, which is sometimes known as Riedel's lobe. It is said to be uniformly due to cholelithiasis, but that it is not always associated with gall-stones our experience in several cases demonstrates.

The liver is sometimes displaced vertically, as in Cases 207 and 270, where the incision had to be prolonged quite up to the ensiform cartilage, in order to reach the shrunken gall-bladder, lying under cover of the right lobe, the 'under' surface of which faced to the left side. In this case the left lobe was much smaller than the right, which formed the great bulk of the liver.

In one case the left lobe was apparently wanting, and the gall-bladder was deeply placed under the right lobe, which faced to the left.

There have been several cases reported where the distended gall-bladder projected into the loin, and was reached and evacuated through a lumbar incision, the condition of liver just described being the probable cause of the distortion.

Dr. J. F. Baldwin of Columbia, Ohio, has furnished me with the notes of a case that came under his care in which the liver was malformed, there being practically no left lobe, and the gall-bladder, instead of occupying the usual position on the under surface of the right lobe, passed downwards and backwards, and lay just to the right of the vertebral column, in which situation it was opened with difficulty for the removal of gall-stones, and drained.

## CHAPTER II

### PHYSIOLOGICAL CONSIDERATIONS

THE gall-bladder is an appendage of the liver, and, so far as can be ascertained, plays the rôle of a biliary reservoir, whose function is to store a certain amount of the bile between meals, and to expel it during the course of digestion. It would, therefore, be impossible to consider its physiology without some reference to that of the fluid it holds.

By the kind permission of the Royal Society I am permitted to insert in this volume the details of some original observations bearing on the physiology of the gall-bladder and of the bile which I made on cases of biliary and gall-bladder fistulæ in the human subject. They were published in vol. xlvii. of the *Proceedings* of the Royal Society. (See p. 21 *et seq.*)

The absence of the gall-bladder in the horse and some other animals, and the good health of patients after its removal by cholecystectomy, clearly prove that its presence is not essential to life; but as it is scarcely consistent with the economy of Nature to provide beings with purposeless organs, and since the reputed function of the gall-bladder as a reservoir of the bile between the periods of digestion is both rational and probable, we may accept the theory until some better one is discovered. But if the exact nature of its use be not quite clear, we are in no doubt as to the fact that, although gall-stones are formed both in the liver and in the gall-bladder, their increase in size most frequently occurs in the gall-bladder alone.

My own experiments, as well as the observations of others, would lead one to believe that the bile is constantly being

excreted. According to Beaunis ('*Éléments de Physiologie*,' p. 718), the excretion in the cat is effected under a pressure of from 2 to 20 millimetres of mercury, which slight pressure is sufficient to cause it to be forced slowly into the intestine.

In all probability, after digestion is completed, the bile flows into the gall-bladder, and when that organ is full the remainder passes drop by drop into the intestine; but on the resumption of digestion the reserve of bile is gradually expelled by a reflex act.

Since gall-stones are composed principally of cholesterine, frequently combined with bilirubin-calcium-carbonate, one can easily understand how that, given a nucleus and some altered condition of bile leading to the deposition of cholesterine, the elements would be present for the more or less rapid growth of concretions. This altered condition of the bile would seem in some cases to be associated with a gouty diathesis.

As in the subjects of cholelithiasis obstruction of the common duct not infrequently occurs, and in consequence a saturation of the system with bile, the observations of M. Bouchard on the poisonous properties of bile have great importance. He says that the bile is nine times more poisonous than urine, and that 4 to 6 c.c. of bile are sufficient to kill one kilogramme of body-weight, so that the liver of a man may form in eight hours sufficient poison to kill him. My own observations also support the view that the bile is almost purely an excretion.

One can easily understand, therefore, that obstruction of the common duct, if at all prolonged, becomes a very serious matter, as, although the re-absorbed bile is partly thrown off by the kidneys, the blood soon becomes altered and the system poisoned. Should the cystic duct be blocked, no such immediate serious results ensue, since the bile can pass on into the intestine; but as we know that the mucous membrane of the gall-bladder is lined with mucous follicles, which continue to secrete even when the normal function of the gall-bladder is in abeyance, it will be easily understood how a tumour may form in such circumstances, and how, by a constant accumulation of the gall-bladder secretion, this

small hollow organ may attain to an enormous size, and may rupture either spontaneously or as the result of some blow or exertion.

I have in one case seen a similar accumulation of fluid in the liver, due to gall-stones blocking the hepatic duct; aspiration led to the diagnosis of hydatid disease, but exploration revealed a dilatation of the hepatic duct within the liver substance, forming a cavity holding half a pint of fluid resembling the retained secretion of the gall-bladder.

M. A. Dastre (*Arch. de Physiol.*, p. 315, 1890; *Centralb. f. d. med. Wissensch.*, No. 30, 1891; and *Brit. Med. Journ.*, September, 1891) finds that in dogs weighing from 9 to 14 kilos (20 to 30 lbs.), the introduction of 100 to 250 grammes of ox bile, or 120 to 230 grammes of dog's bile, into the stomach just before, or one hour after, the taking of food, does not cause any disturbance of digestion or of the general condition of the animal. There is never vomiting, and at most the ox bile causes purging. Five hundred grammes of boiled flesh were given to a dog with a gastric fistula, and one hour afterwards there were introduced into the stomach through the gastric cannula 100 grammes of ox bile. A quarter of an hour afterwards the gastric contents were yellow in colour, and the filtrate had an acid reaction and contained syntonin.

The filtrate, when added to fibrin, rapidly dissolved the latter. An hour later the gastric contents yielded a clear fluid, also of acid reaction, containing peptone and pepsin. The introduction of large quantities of bile into the stomach is not accompanied by any disturbance or even slowing of the gastric digestive process—so rapid is the secretion of acid that the alkaline reaction of the bile is quickly neutralized. These results confirm those of Oddi, who found that when bile was discharged from the gall-bladder directly into the stomach, gastric digestion was not interfered with. With the view of studying the respective parts played by bile and pancreatic juice in the absorption of fats, Dastre made experiments on dogs, which were so arranged that only the upper half of the duodenum was moistened with pancreatic juice; that is, only the pancreas discharged

its secretion into this part of the gut, while into the lower part of the duodenum—15 centimetres below the pylorus—the bile for the first time entered the duodenum. This was done by connecting the gall-bladder to the lower part of the duodenum, and allowing the two to become united. The result was that the digested food after leaving the stomach was subjected to the action of the pancreatic juice alone in the upper half of the duodenum, while in the lower half it was, in addition, acted on by the bile as well as the pancreatic juice. After the animals recovered from the operation, and had remained for months in good condition, they were given a good meal of non-emulsified fat, and were killed by section of the bulb, or narcotized, and their abdominal cavity was opened. In every case the lacteals, as far down as the middle of the duodenum, were transparent, and they only became milky 15 centimetres below where the bile was poured into the duodenum. It would seem from this that the pancreatic juice by itself is unable in the living animal (dog) to covert non-emulsified fat into an emulsion, but that for this purpose it requires the aid of the bile. This view seems to be confirmed by the results obtained in dogs with a complete biliary fistula—that is, where all the bile was discharged externally—for it was found that all the lacteal vessels were filled with a transparent fluid three hours after a hearty meal of non-emulsified fats. If, however, emulsified fats—for example, milk—are given to a dog with a biliary fistula, then, notwithstanding the exclusion of the bile from the intestine, the lacteals from the stomach to the middle of the large intestine are filled with a milky fluid.

**Observations on the Secretion of Bile from a Case of Biliary Fistula and on the Discharge from a Gall-Bladder Fistula.\***

There are few physiological questions on which so much doubt and disagreement prevail as on that of the secretion and uses of bile, this being especially marked when we come to compare the apparently contradictory observations of

\* A. W. Mayo Robson, F.R.C.S., from the *Proceedings* of the Royal Society, vol. xlvii.

various experimenters relating to the action of drugs on the biliary secretion.

As the well-known experiments of Dr. Rutherford and Messrs. Prévost and Binet were conducted on the lower animals, it may possibly account for the difference between their observations and those recorded in this paper. From the rarity of cases of biliary fistula in healthy human subjects, the opportunity has rarely occurred for a careful analysis of fresh bile in sufficient quantity, or for a complete analysis of the *whole* twenty-four hours' secretion; and in all previous analyses no notice has been taken of the gall-bladder secretion.

In the following cases the fistulæ remained open for long periods after the initial operations; the total flow of bile or gall-bladder secretion was carefully collected and accurately measured at different times and for many consecutive hours at a time, and the general good health of the patients was maintained throughout.

**Method of Collecting.**—The fluid was caught in a light glass flask, into the mouth of which it was guided by means of a celluloid cannula, a substance chosen, after several trials with metal ones, on account of its lightness and non-irritating qualities.

**CASE I.—Biliary Fistula.**—Mrs. V. B., aged forty-two, was operated on in January, 1888, for the relief of obstruction in the common bile-duct. The incision was made over the gall-bladder, which was brought to the surface, relieved of its contents, and opened, the margin being sutured to the edge of the abdominal wound and drained. The patient made a good recovery from the operation; but a biliary fistula persisted, through which was discharged the whole of the bile for fifteen months. In order to ascertain that the whole of the bile secreted escaped through the fistula, and that none entered the bowel, repeated analyses of the urine and fæces were made, but no evidence of the presence of bile was obtained at any time. The fistula was ultimately closed by stitching the gall-bladder to the bowel, and making a communication between them, thus enabling the bile to reach the intestine by another channel. A detailed descrip-



tion of the case will be found in the *Transactions* of the Royal Medical and Chirurgical Society for 1889.

**Influence of Biliary Fistula on Digestion and Nutrition.**—During the fifteen months that the fistula was open the patient's digestion seemed to be unimpaired. The appetite generally was good; there was a craving for acids, such as lemons and pickles, and a dislike to sweet foods, to meat, and to fat. Much fatty matter in her food had a marked effect, producing a sickly feeling, with loss of appetite, and rather more fat than normal was then noticed in the fæces. Her bowels were quite regular without the use of aperients, and the odour of the fæces did not differ from that of healthy motion. Menstruation never occurred during the time the fistula was patent, but as soon as the bile was again turned into the intestine the menstrual function became regular and normal.

**CASE 2.—Fistula of Gall-bladder, not Biliary.**—Mrs. A., aged thirty-two, was operated on in June, 1884, for distended gall-bladder due to gall-stones, with stricture of the cystic duct; the patient made a good recovery from the operation, but a fistula of the gall-bladder persisted. From this opening a constant flow of a clear and somewhat viscid fluid persisted, which was held to be the normal secretion of the gall-bladder, as there was complete obstruction of the cystic duct, and as no bile constituents were found in the fluid at the time of the operation or subsequently.

Analyses of the fluid from this patient were made in October, 1885, and in April, 1887, by Professor de Burgh Birch, of the Yorkshire College (see *Journal of Physiology*, vol. viii., No. 6), and in March, 1889, by Mr. Fairley, F.C.S., F.R.S.E. In the appended tables (pp. 31, 33) will be found Mr. Fairley's analysis of the secretion for twenty-four hours both from the biliary and from the gall-bladder fistula.

The alleged **diastatic action** of bile may possibly be due to the admixture of the secretion from the gall-bladder, or from the mucous glands in the large bile-ducts. In the gall-bladder fluid from Case 2, Professor Birch found a diastatic ferment, concerning which he reported: 'The secretion cannot be regarded as having any important part

to play in digestion, the small diastatic action it possesses on starch being shared by many fluids in the economy, upon which it does not confer any special digestive value' (*Journal of Physiology*, vol. viii., No. 6).

**Antiseptic Action.**—In Case 1 the value of bile as an antiseptic in the intestine could be tested only by the character of the fæces, which, over a period of fifteen months, during which no bile entered the bowel, did not by odour or aspect indicate any irregular fermentative process. In Case 2 the

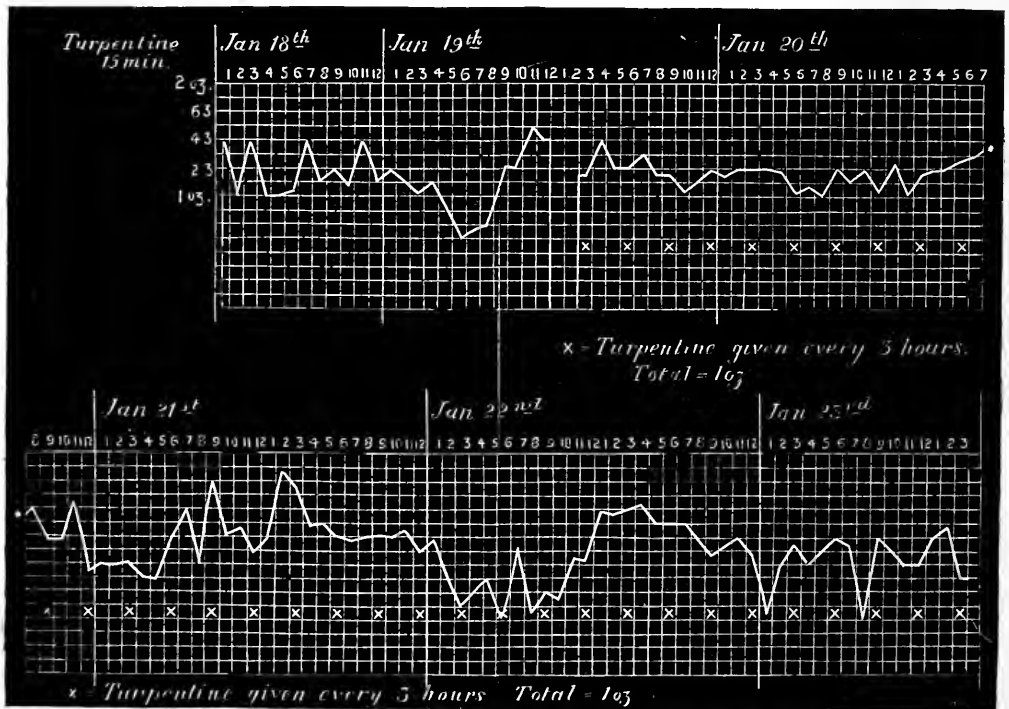


FIG. 14.

constant clean appearance of the edge of the fistula suggested to me the idea that it might be due to the antiseptic quality of the gall-bladder fluid; and the observation that when collecting the fluid for experimental purposes I could leave the flasks exposed to the air for several days without any apparent change suggested the same conclusion. Professor Birch, from numerous cultivation experiments, came to the conclusion that its antiseptic properties were slight, the want of change being rather due to the poverty of the fluid in nourishing materials (*Journal of Physiology*, vol. vii.).

**Aperient Action.**—In Case 1 the bile did not seem to be at all necessary as an intestinal stimulant, for the bowels were quite regular during the whole of the time that no bile was entering the intestines.

**Alleged Action of Bile in promoting Absorption.**—In Case 1 fat could apparently be digested in quantities sufficient, not only to maintain normal nutrition and good health, but to lead to an increase in weight. If taken too freely, it seemed to create disturbances of digestion, and to be passed in rather larger quantities than usual in the fæces, as ascertained by careful observation and by separation by means of ether.

**Diet.**—Details of the daily diet are given in the tables, and may be grouped as follows:

- I. *Oct.* 24—27. Light diet. Broth, bread, egg, tea, milk, pudding.
- II. *Oct.* 29—*Nov.* 4. Chicken diet. Broth, bread, egg, tea, milk, pudding, with chicken.
- III. *Nov.* 5—8. Potato diet. Broth, bread, egg, tea, milk, pudding, with potato.
- IV. *Nov.* 12. Meat diet. Meat, bread, milk, tea.

### Flow of Bile.

The tables appended (p. 33 *et seq.*) show the dates and hours of collection, lasting over a period of eight months, the nature and quantity of the diet, and the amount of bile excreted. The charts (Figs. 14, 15, and 16) also show the dates of administering certain medicines, and their effect or absence of effect on the biliary secretion.

In the drawing up of the charts and tables I have been greatly assisted by my friend Mr. C. W. Biden.

**Daily Quantity of Bile Flow.**—In Case 1 the quantity of bile collected in twenty-four hours on various dates in October, November, and December of 1888, and January, February, March, and April of 1889, varied from 39·53 ounces to 25·86 ounces, and averaged 29·98, or nearly 30, ounces. In Case 2 the gall-bladder fluid measured 2·53 ounces in twenty-four hours.

Subtracting this amount from the twenty-four hours' discharge in Case 1, we get the average daily flow of bile as  $27\frac{1}{2}$  ounces.

**Diurnal Variation in Flow.**—The tables and charts (Figs. 14, 15, and 16) show distinctly that more bile is invariably excreted during the day than at night, the difference at times being as much as 5 ounces, at others not more than 3 drachms.

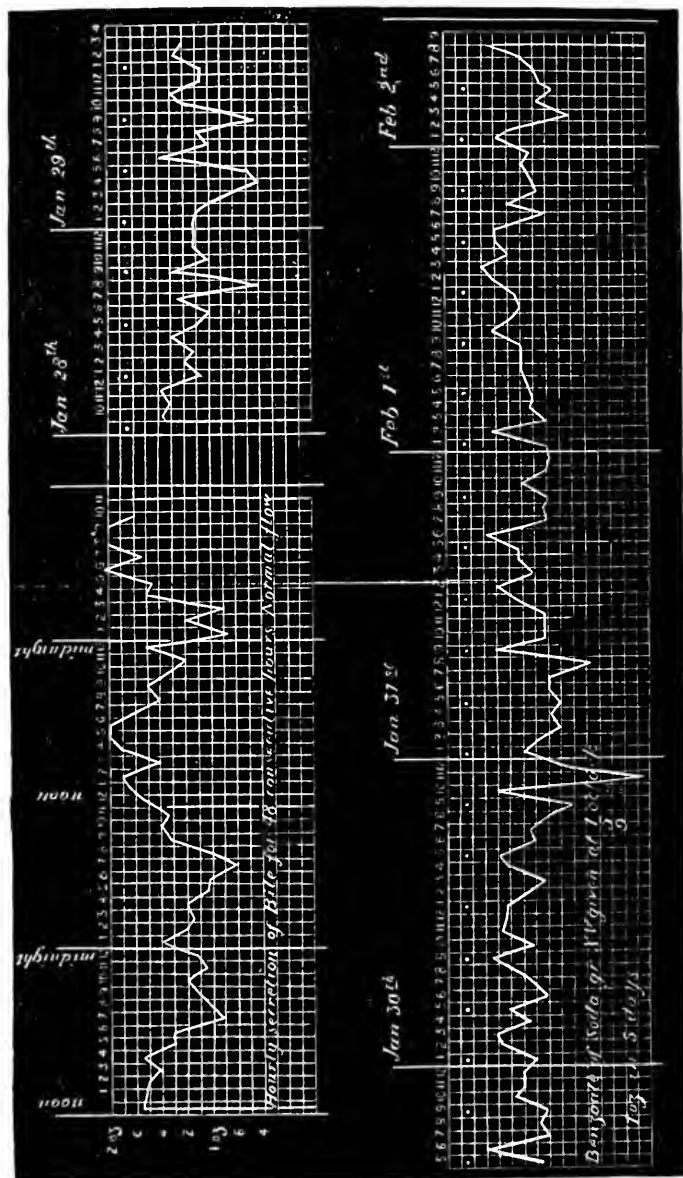


FIG. 15.

In the tables and charts, which show an hourly collection for over twenty-four hours (Figs. 14, 15, and 16), it is clearly seen that the excretion of bile is continuous night and day. These measurements were carefully and regularly made by

the sisters in charge of the ward, under the supervision of the resident surgical officer, Mr. H. Littlewood, F.R.C.S., and my house-surgeons, Mr. B. G. Moynihan, M.S., F.R.C.S., and Mr. F. Hudson, M.R.C.S., to whom I am indebted for the great pains they took over so long a period.

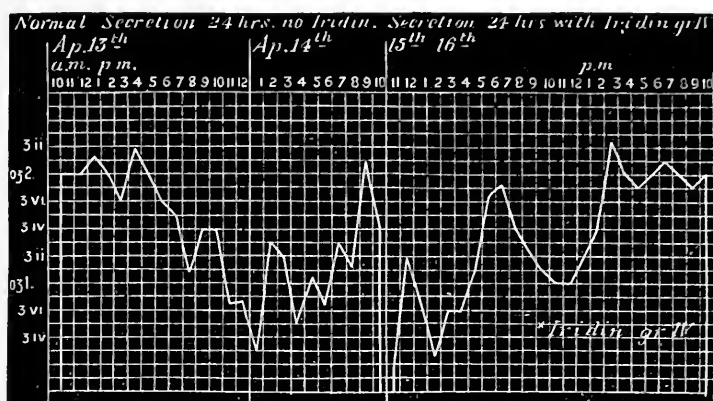


FIG. 16

The daily quantity does not correspond with the observations of Von Wittich and Westphalen, who reported a collection of one pint in the twenty-four hours, with but small variations during ten days.

More solids are contained in the bile by night than by day, as is shown by the analysis of the specimens which were examined by Mr. Fairley. (See appended tables, pp. 31, 33.)

The quantity of bile discharged is apparently not much influenced by the ingestion of food. The reception of food into the stomach is generally contemporaneous with a marked decline in the flow of bile, lasting for about two hours. The colour of the fresh bile was always green when collected in Mrs. V. B's. case, but before exposure to the air it was of a bright orange colour. The violent odour of turpentine was perceived in the bile soon after its administration.

**The Effect of Drugs on the Bile Flow.**—The observations made on the effect or non-effect of certain drugs on the biliary secretion show results that are at variance with the usually accepted views of the action of medicines on the liver.

*Calomel*.—On November 7, 1888, 5 grains of calomel were administered at 7 p.m.; a slight aperient effect followed the next morning, but on comparing the amount of bile excreted before and after, it was found that for ten hours before the administration of the calomel, 12 ounces 6 drachms 20 minims of bile were excreted; and that for ten hours subsequent to the administration 10 ounces 4 drachms 30 minims were excreted—*i.e.*, 2 ounces 1 drachm 50 minims less.

*Euonymin*.—On November 17, 4 grains of euonymin were given at 11.30 a.m.; for the four hours preceding the administration 5 ounces 4 drachms 9 minims, and during the four hours subsequent to its administration 5 ounces 1 drachm 8 minims were excreted—*i.e.*, 3 drachms less. This dose was repeated on several occasions with similar results.

*Rhubarb*.—On November 13, at 11 a.m.,  $\frac{1}{2}$  ounce of tincture of rhubarb was administered; during the preceding six hours 7 ounces 3 drachms 23 minims of bile were excreted, and during the six hours subsequent to the administration of the drug 7 ounces 4 drachms 19 minims were excreted—that is, 56 minims more in the subsequent than in the preceding six hours. But on comparing the corresponding period of the previous day, when no rhubarb was given, we find that 8 ounces 6 drachms 10 minims, or  $1\frac{1}{4}$  ounces more, were excreted. Therefore no increased flow of bile can be put down to the action of the rhubarb.

On November 15, 1 ounce of rhubarb was given. The figures as seen in the tables again show a diminution compared with the previous day.

*Podophyllin* was given on one occasion, and no cholagogue effect was noticed.

*Carbonate of Soda*.—Soda water, aerated, was given, and produced an increased flow. Its ingestion was followed in two hours by a maintained increased flow, not succeeded by a marked diminution.

*Iridin*.—On April 16, 4 grains of iridin were followed by a good afternoon rise in the bile flow, but two days later there was a much higher afternoon rise, when no drug had been

given. On April 19, 4 grains of iridin gave an effect not so pronounced, the increased flow being intermittent. Apparently, the action of iridin is to increase the flow temporarily, without augmenting the total quantity in twenty-four hours.

*Turpentine*.—Messrs. Prévost and Binet state that turpentine and its derivatives promote a notable increase in the excretion. In order to test this, a turpentine capsule, containing 15 minims of the oil of turpentine, was given every four hours night and day.

On January 18 no drug given; 27 ounces 6 drachms 35 minims were excreted in twenty-four hours. On January 19 and 20, during the administration of turpentine capsules, 28 ounces 5 drachms 41 minims were excreted; that is, an increase of 7 drachms. During the following twenty-four hours, the capsules being continued, 30 ounces 2 drachms 10 minims were excreted.

During the third period of twenty-four hours, with the capsules, 26 ounces 57 minims were excreted; and during the fourth twenty-four hours 27 ounces 45 minims.

Therefore, although an increase was apparent on the second day, the daily amount of bile discharged in the twenty-four hours was not so much as on many days when no turpentine was being given, as, for instance, on October 27 and 29, when it was over 30 ounces.

*Benzoate of Soda*.—Messrs. Prévost and Binet state that the administration of benzoate of soda to dogs increased the amount of bile to two or three times the normal. This I do not find to be the result in Case 1, as the table and charts appended will show, where no positive increase is seen.

### Conclusions.

1. The bile is probably chiefly excrementitious, and, like the urine, is constantly being formed and cast out.
2. Though the bile probably assists in the absorption of fats, its presence in the intestine is not necessary for the digestion of such an amount of fat as is capable of supporting life and keeping up nutrition.

3. Increase in body-weight and good health are quite compatible with the entire absence of bile from the intestines.

4. The antiseptic properties of the bile are unimportant.

5. Whatever little antiseptic quality bile may have is probably derived from its admixture with the gall-bladder fluid.

6. The supposed stimulating effect of the bile on the intestinal walls is not necessary for a regular action of the bowels.

7. The quantity of bile excreted in the twenty-four hours during health, in a person of average weight, may vary between 39 ounces 4 drachms and 25 ounces 6 drachms, with an average of 30 ounces, less the  $2\frac{1}{2}$  ounces of fluid secreted by the gall-bladder.

8. More bile is excreted during the day than at night, the excess varying between 5 ounces and 3 drachms.

9. The excretion of bile seems to go on constantly and with great regularity.

10. The excretion is apparently not materially influenced by diet.

11. The pigment of fresh human bile is bilifulvin.

12. The supposed cholagogues investigated seem to rather diminish than increase the amount of bile excreted.

#### **Mr. Fairley's Analysis.**

Analysis of bile drawn from biliary fistula (Mrs. V. B.), collected April 13, 10 a.m. to 10 p.m., and April 13 to 14, 10 p.m. to 10 a.m., 1889.

Columns I., II., III. refer to the whole bile and gall-bladder fluid: Column I., first twelve hours; Column II., second twelve hours; and Column III., the whole fluid collected during twenty-four hours. Column IV. gives the composition of the bile calculated without the gall-bladder fluid.



	I.	II.	III.	IV.
	12 Hours, 10 a.m. to 10 p.m., April 13.	12 Hours, 10 p.m. to 10 a.m., April 13-14.	24 Hours, April 13-14.	24 Hour, corrected for Gall-bladder Fluid.
Quantity ... ..	570 c.c.	370 c.c.	940 c.c.	868 c.c.
Specific gravity ... ..	1'0085	1'0090	1'0087	1'0086
Reaction ... ..	Alkaline.			

The bile contains in 1,000 parts :

Water... ..	982'10	981'79	981'98	981'76
Total solids ... ..	17'90	18'21	18'02	18'24
	1000'00	1000'00	1000'00	1000'00

The solid matter of the bile contains :

	I.	II.	III.	IV.
	12 Hours, 10 a.m. to 10 p.m., April 13.	12 Hours, 10 p.m. to 10 a.m., April 13-14.	24 Hours, April 13-14.	24 Hours, corrected for Gall-bladder Fluid.
Cholesterine ... ..	0'44	0'45	0'45	0'45
Fatty matter (free) ... ..	0'11	0'12	0'12	0'12
Fat combined (chiefly sodium stearate) ... ..	0'90	1'08	0'97	0'97
Sodium glycocholate ... ..	7'45	7'60	7'51	7'51
Sulphur equal to sodium tauro- cholate ... ..	0'087	0'094	0'09	0'09
Organic substances precipi- tated by alcohol, chiefly mucus and epithelium ...	1'31	1'29	1'30	0'85
Chlorides equal to sodium chloride ... ..	5'08	4'91	5'01	4'95
Carbonates and phosphates of sodium, potassium, lime, magnesia, and iron ...	2'52	2'66	2'57	2'54
Copper ... ..	—	minute trace	—	trace
Silica ... ..	—	trace	—	trace
Sulphates } ... ..				
Urea ... ..		none	—	none
Sugar ... ..				

The solid matter of the bile gave on ignition :

Ash per 1,000 parts ... ..	8'15	8'68	8'36	8'34
----------------------------	------	------	------	------

The above analysis of the bile was confirmed by a further quantitative analysis of the bile taken five days later.

The average quantity of bile, as ascertained by observations extending over eight months, was 30 ounces (very nearly 862 c.c.) during twenty-four hours.

SCHEDULE SHOWING AMOUNT OF VARIATION IN FLOW OVER A PERIOD DUE TO THE DRUG.

Drug	Duration of Observing Period.	Difference in Flow from		Actual Flow during Period stated with Drug.	Date.
		The Preceding Period same Day.	Contemporaneous Period previous Day.		
	hrs.	oz. dr. min.	oz. dr. min.	oz. dr. min.	
Calomel	10	- 2 1 50	+ 1 0 20	10 4 30	Nov. 7
Rhubarb	6	+ 0 0 56	- 1 1 51	7 4 19	" 13
"	6	+ 0 4 51	- 2 6 46	7 3 24	" 15
Euonymin	4	- 0 3 1	- 0 2 12	5 1 8	" 17
Turpentine	24	—	+ 0 7 6	28 5 41	Jan. 19
"	"	—	+ 1 4 29	30 2 10	" 20
"	"	—	- 4 1 13	26 0 57	" 21
"	"	—	+ 0 7 48	27 0 45	" 22
" Soda benzoate	"	—	- 1 4 30	26 1 5	" 28
"	"	—	+ 3 5 10	29 6 15	" 29
"	"	—	- 3 3 10	26 3 5	" 30
"	"	—	+ 2 1 15	28 4 20	" 31
"	"	—	+ 2 0 25	30 4 45	Feb. 1

Minus = decrease of 'so much,' possibly due to drug.  
 Plus = increase of 'so much,' possibly due to drug.

Analysis of fluid from the gall-bladder (collected during twenty-four hours. Mrs. A.). Received April 29, 1889.

Quantity	...	...	...	...	72 c.c.
Specific gravity	...	...	...	...	1·0095
Reaction	...	...	...	...	Alkaline.

The fluid contains in 1,000 parts :

Water	...	...	...	...	984·64
Total solids*	...	...	...	...	15·36

The solid matter contains :

Organic matter, chiefly mucin, with trace of albumin	6·72
Chlorides equal to sodium chloride	5·73
Sodium carbonate	2·20
Other salts, containing phosphates, potassium salts, etc.	0·71

MRS. V. B. AGE FORTY-TWO. DAILY EXCRETION OF BILE.

October 24—				oz.	dr.	min.
12-1 p.m.	Fish, 6 oz. ; pudding	...	...	1	4	59
1-2	...	...	...	1	4	30
2-3	...	...	...	1	1	40
3-4	...	...	...	1	1	40
4-5	Tea, 14 oz. ; bread, 5½ oz. ; egg,	1	1	1	1	0
5-6	...	...	...	0	7	0
6-7	...	...	...	1	3	0
7-8	Milk, 1 pint	...	...	1	2	0
8-9	...	...	...	1	2	46
9-10	...	...	...	1	2	0
10-7 a.m.	Milk, 1 pint	...	...	6	5	0
7-8	Tea, 16 oz. ; bread, 5½ oz.	...	...	1	2	30
8-9	...	...	...	1	4	0
9-10	...	...	...	1	2	40
10-11	Beef tea, 1 pint	...	...	1	3	30
11-12 noon	...	...	...	1	2	0

Total quantity excreted in 24 hours	oz.	dr.	min.
From 10 p.m. to 10 a.m.	10	6	10
„ 10 a.m. to 10 p.m.	15	4	5

\* The solid matter was carefully dried until its weight was constant, and on ignition gave 8·64 parts of ash.

October 25—

				oz.	dr.	min.
10-11 a.m.	Beef tea, 1 pint	...	...	1	3	30
11-12 noon	...	...	...	1	2	0
12-1	...	...	...	1	1	45
1-2	...	...	...	1	1	40
2-3	...	...	...	1	2	0
3-4	Tea, 10 oz. ; bread, 6 oz. ; egg, 1	...	...	1	0	30
4-5	...	...	...	1	1	0
5-6	...	...	...	1	3	0
6-7	Chicken broth, 12 oz.	...	...	1	4	0
7-8	...	...	...	1	1	0
8-9	...	...	...	1	3	0
9-10	Milk, 1 pint	...	...	0	7	0
10-5 a.m.	...	...	...	7	5	0
5-6	...	...	...	1	1	30
6-7	...	...	...	1	0	30
7-8	Tea, 10 oz. ; bread, 4½ oz.	...	...	1	2	0
8-9	...	...	...	1	3	0
9-10	...	...	...	1	4	0

		oz.	dr.	min.
10 a.m. to 10 p.m. ...	...	14	6	25
10 p.m. to 10 a.m. ...	...	14	0	0
		28	6	25

October 26—

10-11 a.m.	...	...	...	1	2	25
11-12 noon	...	...	...	1	4	0
12-1	Broth, 18 oz. ; pudding, 11 oz.	...	...	1	0	37
1-2	Bread, 1 oz.	...	...	1	3	30
2-3	...	...	...	1	2	0
3-4	...	...	...	1	4	0
4-5	Tea, 16 oz. ; bread, 5 oz. ; egg, 1	...	...	1	0	35
5-6	...	...	...	1	4	0
6-7	...	...	...	1	0	40
7-8	Milk, 1 pint	...	...	0	6	50
8-9	...	...	...	1	2	15
9-10	...	...	...	1	2	0
10-5 a.m.	Milk, 1 pint	...	...	7	6	0
5-6	...	...	...	1	2	0
6-7	Tea, 10 oz. ; bread, 4½ oz.	...	...	1	0	0
7-8	...	...	...	1	0	0
8-9	...	...	...	1	5	0
9-10	...	...	...	1	4	35

		oz.	dr.	min.
10 a.m. to 10 p.m. ..	...	15	0	52
10 p.m. to 10 a.m. ...	...	14	1	35
		29	2	27

October 27—

				oz.	dr.	min.
10-11 a.m.	...	...	...	...	1	4 35
11-12 noon	Broth, 17 oz.	pudding, 7½ oz.	...	...	1	4 0
12-1	...	...	...	...	1	0 0
1-2	...	...	...	...	1	0 0
2-3	...	...	...	...	1	2 10
3-4	...	...	...	...	1	3 33
4-5	Tea, 17 oz.	bread, 5 oz.	egg, 1	...	1	2 0
5-6	...	...	...	...	1	4 0
6-7	...	...	...	...	1	2 0
7-8	Milk, 19 oz.	...	...	...	1	2 50
8-9	...	...	...	...	1	0 0
9-10	...	...	...	...	1	2 0
10-5 a.m.	...	...	...	...	7	6 0
5-6	...	...	...	...	1	0 0
6-7	...	...	...	...	1	2 55
7-8	Tea, 16 oz.	bread, 5½ oz.	milk,	...	...	...
	10 oz.	...	...	...	1	4 0
8-9	...	...	...	...	1	4 0
9-10	...	...	...	...	1	5 0
10-11	...	...	...	...	1	2 50
11-12	...	...	...	...	1	4 45

		oz.	dr.	min.
10 a.m. to 10 p.m....	...	15	3	8
10 p.m. to 10 a.m....	...	14	5	55
		30	1	3

October 29—

7-8 a.m.	Tea, 10 oz.	...	...	...	1	2 45
8-9	Bread, 5 oz.	...	...	...	2	0 0
9-10	Milk, 9 oz.	...	...	...	1	5 40
10-11	...	...	...	...	1	3 0
11-12 noon	...	...	...	...	1	1 0
12-1	Chicken, 7 oz.	pudding, 6 oz.	...	...	1	5 11
1-2	...	...	...	...	1	4 0
2-3	...	...	...	...	1	4 0
3-4	...	...	...	...	1	3 0
4-5	Tea, 15 oz.	bread, 5½ oz.	egg, 1	...	1	2 50
5-6	...	...	...	...	1	2 0
6-7	Milk, 12 oz.	...	...	...	1	0 57
7-8	...	...	...	...	1	3 30
8-9	...	...	...	...	1	3 57
9-10	Milk, 10 oz.	...	...	...	1	1 25
10-5 a.m.	Milk, 18 oz.	...	...	...	8	1 50
5-6	...	...	...	...	1	1 50
6-7	...	...	...	...	1	0 40
7-8	Tea, 15 oz.	bread, 5½ oz.	...	...	1	0 35
8-9	Bread, 5½ oz.	...	...	...	1	4 40
9-10	...	...	...	...	1	2 0

		oz.	dr.	min.
10 a.m. to 10 p.m....	...	16	2	50
10 p.m. to 10 a.m....	...	14	3	35
		30	6	25

October 30—

				oz.	dr.	min.
10-11 a.m.	...	...	...	...	1	3 30
11-12 noon	Chicken, 6 oz.	...	...	...	1	3 25
12-1	...	...	...	...	1	2 0
1-2	...	...	...	...	1	3 10
2-3	...	...	...	...	0	0 0
3-4	Tea, 17 oz.; bread	...	...	...	1	0 42
4-5	...	...	...	...	1	4 0
5-6	...	...	...	...	1	6 46
6-7	Milk, 11 oz.	...	...	...	1	2 0
7-8	...	...	...	...	1	1 1
8-9	...	...	...	...	1	2 0
9-10	...	...	...	...	1	2 40
10-5	Milk, 1 pint	...	...	...	7	6 6
5-6	...	...	...	...	0	7 50
6-7	...	...	...	...	1	2 0
7-8	Tea, 15 oz.; bread, 5½ oz.	...	...	...	1	3 0
8-9	...	...	...	...	1	5 1
9-10	Milk, 12 oz.	...	...	...	1	4 0

	oz.	dr.	min.
10 a.m. to 10 p.m....	...	14	7 14
10 p.m. to 10 a.m....	...	14	3 57
	29	3	11

October 31—

10-11 a.m.	...	...	...	...	1	4 0
11-12 noon	...	...	...	...	1	1 20
12-1	Chicken, 6 oz.; pudding, 11 oz.; milk, 8 oz.	...	...	...	1	2 25
1-2	...	...	...	...	1	2 35
2-3	...	...	...	...	1	3 0
3-4	Tea, 10 oz.; bread, 5 oz.	...	...	...	1	3 0
4-5	...	...	...	...	1	2 0
5-6	...	...	...	...	1	1 20
6-7	Milk, 18 oz.	...	...	...	1	3 25
7-8	...	...	...	...	0	7 32
8-9	...	...	...	...	1	0 17
9-10	...	...	...	...	0	7 50
10-5 a.m.	Milk, 1 pint	...	...	...	6	6 0
5-6	...	...	...	...	1	3 0
6-7	...	...	...	...	1	4 0
7-8	Tea, 15 oz.; bread, 5½ oz.	...	...	...	1	3 0
8-9	...	...	...	...	1	3 50
9-10	...	...	...	...	1	3 45

	oz.	dr.	min.
10 a.m. to 10 p.m....	...	14	6 44
10 p.m. to 10 a.m....	...	13	7 35
	28	6	19

November 1—				oz.	dr.	min.
10-11 a.m.	Milk, 12 oz.	...	...	...	1	0 45
11-12 noon	...	...	...	...	1	2 55
12-1	Chicken, 12 oz. ; pudding, 9 oz.	...	...	...	1	5 0
1-2	...	...	...	...	1	2 35
2-3	...	...	...	...	1	4 0
3-4	Tea, 20 oz. ; bread, $5\frac{1}{2}$ oz. ; egg, 1	...	...	...	1	3 0
4-5	...	...	...	...	1	0 0
5-6	...	...	...	...	1	3 0
6-7	Milk, 15 oz.	...	...	...	1	1 10
7-8	...	...	...	...	1	4 0
8-9	...	...	...	...	1	0 59
9-10	...	...	...	...	1	1 25
10-5 a.m.	...	...	...	...	7	4 30
5-6	...	...	...	...	1	1 0
6-7	...	...	...	...	1	0 30
7-8	Tea, 20 oz. ; bread, $6\frac{1}{2}$ oz.	...	...	...	0	7 0
8-9	...	...	...	...	1	5 10
9-10	...	...	...	...	1	4 0

	oz.	dr.	min.
10 a.m. to 10 p.m....	...	15	4 49
10 p.m. to 10 a.m....	...	13	6 10

29 2 59

November 2—				oz.	dr.	min.
10-11 a.m.	Milk, 20 oz.	...	...	...	1	5 10
11-12 noon	Chicken and bread, 6 oz. ; pudding, 11 oz.	...	...	...	1	2 40
12-1	...	...	...	...	1	1 0
1-2	...	...	...	...	1	6 0
2-3	...	...	...	...	1	2 19
3-4	...	...	...	...	1	1 2
4-5	Tea, 9 oz.	...	...	...	1	4 0
5-6	...	...	...	...	1	4 0
6-7	Milk, 15 oz.	...	...	...	1	2 3
7-8	...	...	...	...	0	5 2
8-9	...	...	...	...	1	0 40
9-10	...	...	...	...	0	7 35
10-5 a.m.	...	...	...	...	6	4 0
5-6	...	...	...	...	1	1 10
6-7	...	...	...	...	0	7 39
7-8	...	...	...	...	1	0 35
8-9	...	...	...	...	1	4 17
9-10	...	...	...	...	1	4 50

	oz.	dr.	min.
10 a.m. to 10 p.m. ...	...	15	1 31
10 p.m. to 10 a.m. ...	...	12	6 31

28 0 2

November 3—

				oz.	dr.	min.
10-11 a.m.	Milk, 9 oz.	...	...	1	1	0
11-12 noon	...	...	...	1	1	15
12-1	Chicken, 6½ oz.; pudding, 6½ oz.			1	1	15
1-2	...	...	...	1	7	50
2-3	...	...	...	1	0	0
3-4	Tea, 15 oz.; bread, 6 oz.; egg, 1			1	1	30
4-5	...	...	...	1	4	0
5-6	...	...	...	1	4	0
6-7	Milk, 9 oz.	...	...	0	6	0
7-8	Euonymin, gr. jss., at 7 p.m.			1	3	10
8-9	...	...	...	1	2	0
9-10	...	...	...	1	1	32
10-5 a.m.	...	...	...	8	1	0
5-6	...	...	...	1	1	40
6-7	...	...	...	1	1	40
7-8	Tea, 11 oz.; bread, 4 oz.			1	0	0
8-9	...	...	...	1	6	0
9-10	...	...	...	1	4	0

		oz.	dr.	min.
10 a.m. to 10 p.m.	...	15	1	32
10 p.m. to 10 a.m.	...	14	6	20

29 7 52

November 4—

10-11 a.m.	Milk, 9 oz.	...	...	1	2	0
11-12 noon	...	...	...	1	1	0
12-1	Chicken, 6 oz.; pudding, 9 oz.; milk, 9 oz.	...	...	1	2	0
1-2	...	...	...	1	5	0
2-3	...	...	...	1	4	45
3-4	Bread, 3 oz.; tea, 16 oz.; egg, 1	...	...	0	6	0
4-5	...	...	...	1	1	0
5-6	...	...	...	1	4	0
6-7	...	...	...	1	0	0
7-8	...	...	...	1	2	0
8-9	...	...	...	1	1	0
9-10	Euonymin, gr. iii., at 10.30 p.m.	...	...	1	0	15
10-5 a.m.	Milk, 1 pint	...	...	7	0	10
5-6	...	...	...	1	0	36
6-7	...	...	...	1	3	5
7-8	Tea, 10 oz.; bread, 6 oz.			1	0	45
8-9	...	...	...	1	0	0
9-10	Milk, 9 oz.	...	...	1	0	0

		oz.	dr.	min.
10 a.m. to 10 p.m.	...	14	5	0
10 p.m. to 10 a.m.	...	12	4	36

27 1 36



November 5—

				oz.	dr.	min.
10-11 a.m.	...	...	...	1	2	0
11-12 noon	...	...	...	1	0	40
12-1	Chicken and potato, 8 oz. ; pudding			1	4	0
1-2	...	...	...	1	2	25
2-3	...	...	...	1	1	40
3-4	Tea, 16 oz. ; bread, 6 oz. ; egg, 1	...		1	1	15
4-5	...	...	...	1	3	0
5-6	...	...	...	1	2	50
6-7	Milk, 10 oz.	...	...	1	1	0
7-8	...	...	...	1	0	25
8-9	...	...	...	0	7	0
9-10	...	...	...	1	6	55
10-5 a.m.	Milk, 1 pint	...	...	7	0	0
5-6	...	...	...	1	0	0
6-7	...	...	...	0	7	0
7-8	Tea, 16 oz. ; bread, $4\frac{1}{2}$ oz.	...		1	3	10
8-9	...	...	...	1	2	0
9-10	...	...	...	1	4	0

		oz.	dr.	min.
10 a.m. to 10 p.m. ...	...	15	1	10
10 p.m. to 10 a.m. ...	...	13	0	10

28 1 20

November 6—

10-11 a.m.	Milk, 8 oz.	...	...	1	4	20
11-12 noon	Chicken and potato, 7 oz. ; pudding,					
	8 oz.	...	...	1	2	25
12-1	...	...	...	1	4	0
1-2	...	...	...	1	1	50
2-3	...	...	...	1	1	0
3-4	Tea, 10 oz. ; bread, 6 oz.	...		1	1	10
4-5	...	...	...	1	0	0
5-6	...	...	...	1	3	0
6-7	Milk, 10 oz.	...	...	1	2	0
7-8	...	...	...	1	3	0
8-9	...	...	...	1	0	0
9-10	...	...	...	1	0	5
10-5 a.m.	Milk, 1 pint	...	...	6	1	5
5-6	...	...	...	0	1	30
6-7	...	...	...	0	3	0
7-8	Tea, 11 oz. ; bread, $4\frac{1}{2}$ oz.	...		1	1	30
8-9	...	...	...	1	5	0
9-10	Milk, 8 oz.	...	...	1	4	0

		oz.	dr.	min.
10 a.m. to 10 p.m. ...	...	14	6	50
10 p.m. to 10 a.m. ...	...	11	0	5

25 6 55

November 7—

				oz.	dr.	min.
10-11 a.m.	...	...	...	1	2	0
11-12 noon	Chicken and potato, 8 oz.			1	0	0
12-1	...	...	...	1	2	0
1-2	...	...	...	1	2	0
2-3	...	...	...	1	2	20
3-4	Tea, 16 oz.; bread, 6 oz.; egg, 1...			1	2	0
4-5	...	...	...	1	2	10
5-6	...	...	...	1	3	10
6-7	Milk, 17 oz.	...	...	1	2	40
7-8	Calomel, gr. v.	...	...	1	0	0
8-9	...	...	...	1	0	0
9-10	...	...	...	0	6	0
10-5 a.m.	...	...	...	7	6	30
5-6	...	...	...	1	0	0
6-7	...	...	...	0	6	35
7-8	Tea, 16 oz.; bread, 4½ oz.			0	7	0
8-9	...	...	...	1	2	0
9-10	Milk, 10 oz.	...	...	1	3	0

		oz.	dr.	min.
10 a.m. to 10 p.m. ...	...	14	0	20
10 p.m. to 10 a.m. ...	...	13	1	5

---

 27 1 25

At 7 p.m., calomel, gr. v.

10 hours *before* ... 12 6 2010 hours *after* ... 10 4 30Corresponding 10 hours *after*  
on previous day ... 9 4 10

November 8—

10-11 a.m.	...	...	...	1	2	40
11-12 noon	Chicken and potato, 8 oz.; milk,					
	8 oz.; gravy, 1 oz.	...	...	1	0	0
12-1	...	...	...	1	2	0
1-2	...	...	...	1	1	30
2-3	...	...	...	1	4	0
3-4	Tea, 19 oz.; bread, 2½ oz.; egg, 1			1	1	25
4-5	...	...	...	1	1	55
5-6	...	...	...	1	3	20
6-7	...	...	...	1	2	0
7-8	...	...	...	1	4	0
8-9	...	...	...	1	1	0
9-10	...	...	...	1	0	20
10-5 a.m.	Milk, 16 oz.	...	...	6	6	0

		oz.	dr.	min.
10 a.m. to 10 p.m. ...	...	15	0	10
10 p.m. to 10 a.m. ...	...	12	6	25

---

 27 6 35

<i>November 9—</i>				oz.	dr.	min.
5-6 a.m.	...	..	...	...	I	I 50
6-7	...	...	...	...	I	2 0
7-8	Tea, 19 oz.;	bread, 4½ oz.	...	...	I	I 55
8-9	...	...	...	...	I	3 40
9-10	Milk, 10 oz.	...	...	...	0	7 0
10-11	...	...	...	...	I	I 0
11-12	Chicken and potato, 8 oz.;	pudding,	...	...	...	...
	8 oz.	...	...	...	I	I 15
12-1	...	...	...	...	I	I 45
1-2	...	...	...	...	I	2 0
2-3	...	...	...	...	I	I 35
3-4	Tea, 12 oz.;	bread, 4½ oz.	...	...	I	4 0
4-5	...	...	...	...	0	5 0
5-6	...	...	...	...	I	I 25
6-7	..	...	...	...	I	I 5
7-8	...	...	...	...	I	0 0
8-9	...	...	...	...	I	2 0

			oz.	dr.	min.
9 a.m. to 9 p.m.	...	...	I 3	4	5

<i>November 12—</i>				oz.	dr.	min.
9-12 noon	Milk, 1 pint	...	...	...	3	4 0
12-1	Meat, etc., 16 oz.;	water, 10 oz.	...	...	I	3 2
1-2	...	...	...	...	I	2 2
2-3	...	...	...	...	I	3 1
3-4	Tea, 20 oz.;	bread, 2 oz.	...	...	I	4 2
4-5	...	...	...	...	I	6 3
5-6	...	...	...	...	I	6 2
6-7	...	...	...	...	I	4 1
7-8	...	...	...	...	I	4 2
8-9	...	...	...	...	I	2 1

			oz.	dr.	min.
9 a.m. to 9 p.m.	...	...	I 6	6	I 6

<i>November 13—</i>				oz.	dr.	min.
5-6 a.m.	...	...	...	...	I	3 0
6-7	...	...	...	...	I	0 10
7-8	...	...	..	...	0	7 5
8-9	Tea, 1 pint;	bread, 4 oz.	...	...	I	4 4
9-10	...	...	...	...	I	4 3
10-11	Milk, 10 oz.	...	...	...	I	I 1
11-12	Tinct. rhei, ʒss.	...	...	...	0	6 5
12-1	Meat, etc., 10 oz.;	water, 10 oz.	...	...	I	2 1
1-2	...	...	...	...	I	0 2
2-3	...	...	...	...	I	0 0
3-4	...	...	...	...	I	6 3
4-5	Tea, 1 pint;	bread, 1 oz.	...	...	I	6 8
5-6	...	...	...	...	I	0 8
6-7	...	...	...	...	I	2 6
7-8	Milk, 15 oz.;	bread, 2 oz.	...	...	I	0 0
8-9	..	...	..	...	I	I 8
9-10	...	...	...	..	I	2 0

November 13—continued :

			oz.	dr.	min.
5 a.m. to 11 a.m.	...	...	7	3	23
At 11, tinct. rhei, $\bar{3}$ ss.					
11 a.m. to 5 p.m.	...	...	7	4	19
9 a.m. to 9 p.m.	...	...	14	4	45

(Cf. November 9 and 12, and November 14 and 15.)

10 a.m. to 10 p.m.	...	...	14	2	42
10 p.m. to 10 a.m.	not measured.				

November 14—

6 a.m. to 6 p.m.	...	...	16	6	37
9 a.m. to 9 p.m.	...	...	17	7	45
11 a.m. to 5 p.m.	...	...	9	6	11
12 a.m. to 6 p.m.	...	...	10	2	10

November 15—

6-7 a.m.	...	...	...	1	2	0
7-8	...	...	...	0	6	4
8-9	Tea, 20 oz.; bread, 2 oz.		...	1	0	8
9-10	...	...	...	1	0	5
10-11	Milk, 10 oz.		...	1	6	10
11-12	Tinct. rhei, $\bar{3}$ i.		...	1	0	6
12-1	Meat, etc., 12 oz.; water, 10 oz.		...	1	2	4
1-2	...	...	...	1	2	0
2-3	...	...	...	1	4	2
3-4	...	...	...	1	2	8
4-5	Tea, 20 oz.; bread, $1\frac{1}{2}$ oz.		...	1	0	10
5-6	...	...	...	1	1	0
6-7	...	...	...	1	7	3
7-8	Milk, 15 oz.; bread, 1 oz.		...	1	5	4
8-9	...	...	...	1	0	5
9-10	...	...	...	1	1	0

At 11.30, tinct. rhei, $\bar{3}$ i.		oz.	dr.	min.
6 a.m. to 12	...	6	6	33
12 to 6 p.m.	...	7	3	24
9 a.m. to 9 p.m.	...	15	5	57

November 16—

ember 16—				oz.	dr.	min.	
6-7 a.m.	...	...	...	...	1	2	0
7-8	...	...	...	...	1	2	8
8-9	Tea, 20 oz.;	bread, 6 oz.	...	...	1	4	6
9-10	...	...	...	...	1	3	2
10-11	Milk, 10 oz.	...	...	...	0	0	0
11-12	...	...	...	...	2	7	3
12-1	Meat, 16 oz.	...	...	...	1	2	5
1-2	...	...	...	...	1	4	3
2-3	Water, 10 oz.	...	...	...	1	4	7
3-4	...	...	...	...	1	1	5
4-5	Tea, 20 oz.;	bread, 3 oz.	...	...	1	4	3
5-6	...	...	...	...	1	5	4
6-7	...	...	...	...	1	0	3
7-8	Milk, 15 oz.;	bread, 2 oz.	...	...	0	7	5
8-9	...	...	...	...	1	1	7

			oz.	dr.	min.
6 a.m. to 6 p.m.	...	...	16	6	46

November 17—

7-8 a.m.	...	...	...	...	1	2	4
8-9	Tea, 20 oz.;	bread, 7 oz.	...	...	1	6	1
9-10	...	...	...	...	1	2	1
10-11	Milk, 10 oz.	...	...	...	1	2	3
11-12	Euonymin, gr. iv.	..	...	...	1	3	4
12-1	Meat, etc., 16 oz.;	water, 10 oz.	...	...	1	2	5
1-2	...	...	...	...	1	2	0
2-3	...	...	...	...	1	3	0
3-4	...	...	...	...	1	2	3
4-5	Tea, 20 oz.;	bread, 2 oz.	...	...	1	3	5
5-6	...	...	...	...	1	4	7
6-7	...	...	...	...	2	2	0
7-8	Milk, 15 oz.;	bread, 2 oz.	...	...	1	1	1
8-9	...	...	...	...	1	0	3
9-10	...	...	...	...	1	3	0

			oz.	dr.	min.
7 a.m. to 11 a.m.	...	...	5	4	9
At 11.30, euonymin, gr. iv.					
12 to 4 p.m.	...	...	5	1	8
10 a.m. to 10 p.m.	...	...	16	3	31

Hour of the Day.	Jan. 18 and 19.*	Jan. 19 and 20.	Jan. 20 and 21.	Jan. 21 and 22.	Jan. 22 and 23.
Noon	oz. dr. min. 1 4 0 1 0 0 1 4 0 1 0 0 1 0 25 1 4 0 1 1 0 1 2 0 1 0 40 1 4 0 1 1 0	oz. dr. min. — — — † 1 4 0 1 2 0 1 2 0 † 1 3 0 1 1 30 1 1 30 † 1 0 25 1 1 0 1 1 50	oz. dr. min. — — — † 1 2 0 1 2 10 1 2 40 † 1 3 10 1 4 0 1 1 40 † 1 1 40 1 4 35 0 7 0	oz. dr. min. — — — † 1 2 41 1 3 0 1 2 0 † 1 2 40 1 2 0 † 1 2 6 1 2 0 1 2 40 † 1 1 0	oz. dr. min. — — — 1 4 10 1 3 0 † 1 3 0 1 3 0 1 2 0 † 1 0 40 1 1 20 1 2 0 † 1 0 45
Midnight	Jan. 19. 1 2 0 1 1 0 1 0 25 1 1 0 0 7 0 0 5 0 0 5 45 0 6 0 1 2 20 1 2 0 1 5 0 1 4 0	Jan. 20. † 1 1 30 1 2 0 1 2 0 † 1 2 0 1 1 50 1 0 25 † 1 0 50 1 0 0 1 2 6 1 1 0 † 1 1 0 1 2 0 1 4 0	Jan. 21. † 1 0 0 1 0 0 1 0 0 † 0 7 0 0 6 55 1 1 45 † 1 4 0 1 0 0 1 6 0 † 1 2 0 1 2 42 1 0 40 † 1 2 0 1 6 43 1 5 30	Jan. 22. 1 2 0 0 6 45 † 0 4 55 0 6 25 0 6 55 † 0 4 0 1 1 30 0 4 20 † 0 6 0 0 5 30 1 0 30 † 1 0 20 1 4 0 1 3 40 † 1 4 0	Jan. 23. 0 4 0 1 0 0 † 1 1 30 1 0 0 1 1 0 † 1 2 0 1 1 30 0 4 0 † 1 2 0 1 1 0 1 0 0 † 1 0 0 1 2 0 1 2 50 † 0 7 0
Total amount of bile in 24 hours }	27 6 35	28 5 41	30 2 10	26 0 57	27 0 45

\* No turpentine given these 24 hours. † Means 15 min. of turpentine given at beginning of hours.

Hour of the Day.	Jan. 28 and 29.	Jan. 29 and 30.	Jan. 30 and 31.	Jan. 31 and Feb. 1.	Feb. 1 and 2.
	oz. dr. min.	oz. dr. min.	oz. dr. min.	oz. dr. min.	oz. dr. min.
9-10	*1 3 30	*1 2 0	*1 1 5	*1 0 10	*1 4 15
10-11	1 3 0	1 3 0	1 3 50	1 0 20	1 2 40
11-12	1 3 50	1 0 40	1 3 30	1 0 20	1 2 0
12-1	1 0 40	1 0 40	1 3 15	1 2 40	1 2 55
1-2	*1 2 0	*1 2 45	*1 1 45	*1 4 0	*1 4 10
2-3	1 1 5	1 2 5	1 0 10	1 1 10	1 5 5
	Not collected (say				
3-4	1 3 0	1 0 0	1 3 0	1 2 25	1 3 0
4-5	1 0 50	1 0 40	1 4 0	1 2 25	1 4 0
5-6	*1 0 0	*1 5 0	*1 1 0	*1 5 5	*1 4 25
6-7	1 2 30	1 0 0	1 1 30	1 0 0	1 0 0
7-8	0 4 0	1 0 45	1 0 40	1 0 25	1 3 0
8-9	1 3 10	1 0 20	0 6 0	1 0 0	1 0 40
9-10	*1 0 0	*1 2 40	*1 4 15	*1 2 0	*1 1 20
10-11	1 1 25	1 2 0	0 0 25	1 0 0	1 2 0
11-12	1 1 0	1 2 0	0 7 0	0 7 50	1 1 15
	Jan. 29.				
Midnight	1 1 20	1 1 0	1 2 0	1 0 0	1 4 0
1-2	*1 0 45	*1 3 40	*1 1 0	*1 5 20	*1 2 0
2-3	0 6 45	1 4 20	0 7 0	1 0 0	0 6 0
3-4	0 4 0	1 1 30	0 7 45	1 1 20	1 0 45
4-5	0 5 0	1 3 20	0 7 0	1 1 20	0 7 20
5-6	*1 4 0	*1 0 0	*1 0 0	*1 1 30	*1 0 35
6-7	0 7 50	1 1 0	1 0 0	1 2 0	1 1 0
7-8	1 1 5	1 2 10	0 4 45	1 2 0	1 2 0
8-9	0 4 20	1 4 40	1 4 10	1 2 0	1 4 40
Total amount of bile in 24 hours	26 1 5	29 6 15	26 3 5	28 4 20	30 4 45

\* Benzoate of soda, gr. xv., administered.

# HOURLY SECRETION OF BILE FOR FORTY-EIGHT CONSECUTIVE HOURS. NORMAL.

<i>April</i> 10—	oz.	dr.	min.	<i>April</i> 11 ( <i>cont.</i> )—	oz.	dr.	min.
11-12 noon...	1	5	30	11-12 noon...	1	5	5
12-1 p.m. ...	1	5	20	12-1.30 p.m.	2	4	30
1-2 ...	1	5	25	1.30-2 ...	1	1	5
2-3 ...	1	4	15	2-3 ...	1	4	0
3-4 ...	1	5	30	3-4 ...	1	7	10
4-5 ...	1	3	0	4-5 ...	2	0	0
5-6 ...	1	3	10	5-6 ...	2	0	0
6-7 ...	0	7	0	6-7 ...	1	6	0
7-8 ...	1	0	0	7-8 ...	1	4	0
8-9 ...	1	1	0	8-9 ...	1	5	10
9-10 ...	1	2	0	9-10 ...	1	3	10
10-11 ...	1	0	35	10-11 ...	1	2	0
11-12 ...	1	1	10	11-12 ...	1	5	20
12-1 a.m. ...	1	4	0	12-1 a.m. ...	0	6	45
<i>April</i> 11—				<i>April</i> 12—			
1-2 ...	1	2	0	1-2 a.m ...	1	2	15
2-3 ...	1	1	30	2-3 ...	0	7	0
3-4 ..	1	2	0	3-4 ...	1	4	55
4-5 ..	1	0	20	4-5 ...	1	4	45
5-6 ...	1	1	15	5-6 ...	2	0	35
6-7 ...	0	6	0	6-7 ...	1	5	10
7-8 ...	1	0	0	7-8 ...	2	0	0
8-9 ...	1	3	30	8-9 ...	2	1	30
9-10 ...	1	4	0	9-10 ...	1	6	0
10-11 ...	1	3	25	10-11 ...	1	6	0
<hr/>				<hr/>			
30 7 55				39 4 25			



BILE FLOW FOR TWENTY-FOUR  
HOURS, WITHOUT IRIDIN.

<i>April</i> 13—	oz.	dr.	min.
10-11 a.m. ...	2	0	0
11-12 ...	2	0	0
Noon 12-1 p.m. ...	2	1	15
1-2 ...	2	0	0
2-3 ...	1	6	0
3-4 ...	2	2	0
4-5 ...	2	0	0
5-6 ...	1	6	0
6-7 ...	1	5	0
7-8 ...	1	0	50
8-9 ...	1	4	0
9-10 ...	1	4	0

10-11 ...	0	6	35
11-12 ...	0	6	45

*April* 14—

12-1 a.m. ...	0	3	0
1-2 ...	1	3	5
2-3 ...	1	2	0
3-4 ...	0	5	0
4-5 ...	1	0	35
5-6 ...	0	6	15
6-7 ...	1	3	0
7-8 ...	1	1	10
8-9 ...	2	1	0
9-10 a.m. ...	1	4	0
Total ...	34	7	30

## FLOW HOURLY BEFORE.

<i>April</i> 16—	oz.	dr.	min.
...	*1	0	0
...	1	0	0
...	1	2	0
...	1	4	0
...	2	2	30
...	2	0	0
...	1	7	0
...	2	0	0
...	2	1	0
...	2	0	0
...	1	7	0
...	2	0	0

<i>April</i> 15—	20	7	30
oz. dr. min.			
0 1 15			
1 2 0			

*April* 16—

0 6 30			
0 2 35			
0 6 0			
0 6 0			
1 1 15			
1 6 35			
1 7 15			
1 4 0			
1 2 30			
1 1 0	12	6	55
12 6 55	33	6	25

\* 10 a.m., iridin, gr. iv.

## CHAPTER III

### INJURIES TO THE BILE PASSAGES

INJURIES to the bile passages are, as might be expected, much less common than injuries to the liver, and they are apt to be confounded with the latter, though in reality they present many points of difference.

They may be caused by a stab or gunshot wound, or by a violent blow or severe compression in the region of the liver. These injuries appear to be more common in persons who have already suffered from biliary calculi or from inflammatory lesions of the gall-bladder or ducts. Such cases have been reported by Terrier, Hofmann, Salmuth, and others.

In a case reported by Janeway, rupture of the gall-bladder was attributed to traction caused by old and firm adhesions, the result of previous gall-stones.

The fundus of the gall-bladder, the most exposed portion of the bile-excreting apparatus, is the part most frequently injured, both in penetrating wounds and in subcutaneous injuries.

Frequently in the case of penetrating wounds the neighbouring organs are injured, *e.g.*—the liver, stomach, or colon.

Ogston and Kilgour reported two cases in which the gall-bladder, with the attached liver tissue, was found completely separated from the rest of the liver.

Courvoisier collected forty-eight cases, of which three were subcutaneous ruptures and fourteen penetrating wounds of the bile passages.

Specimen No. 2,267 in St. Bartholomew's Museum shows a laceration  $\frac{3}{4}$  inch long in a gall-bladder previously dilated, as the result of a gall-stone lodging at the entrance of the

PLATE II



FIG. 17.—LACERATION OF GALL-BLADDER.  
(No. 2,267, St. Bartholomew's Museum.)



FIG. 18.—RUPTURE OF GALL-BLADDER.  
(No. 2,268, St. Bartholomew's Museum.)



cystic duct (Fig. 17). The specimen is from a man of fifty who was kicked when stooping. No. 2,268 shows a rupture of the fundus of the gall-bladder caused by a fall on a piece of timber. Bile escaped into the peritoneum, and death followed from peritonitis after five weeks (Fig. 18).

No. 2,268A shows a perforating wound of the gall-bladder from a boy of fifteen who fell from a load of straw on to a pitchfork. Death occurred after five days from extravasation of bile and peritonitis (Fig. 19).

No. 1,388 in Guy's Museum is a case of lacerated gall-bladder from a man of twenty-nine who was kicked in the abdomen and died on the seventeenth day from peritonitis. The laceration in the gall-bladder measures  $\frac{3}{4}$  inch (Fig. 20).

In all cases where the history is appended, the fact of the long survival after so serious an accident is notable, and the lesson is manifest that operation would in each case have given good hopes of success.

As a result of a wound or rupture of any part of the biliary secreting apparatus, extravasation of bile occurs into the peritoneum. As a rule the bile occupies the right half of the abdomen, extending down to the iliac fossa. It is confined to this portion of the abdomen by the insertion of the mesentery, but occasionally it extends to the pelvis, or even into the left loin. After a certain time the collection of bile becomes encapsuled by the formation of a false membrane on the surrounding viscera. This false membrane frequently seals the opening in the gall-bladder or ducts, preventing the further escape of bile, and rendering it difficult at an operation to detect the actual situation of the injury. The symptoms observed in the majority of cases are more or less profound shock, followed by reaction, rise of temperature, and pain in the right hypochondrium, with the appearance of dulness on the right side of the abdomen. The most characteristic sign of injury to the bile passages is the appearance of jaundice after some days, owing to the reabsorption of the extravasated bile. This is characteristic, and does not occur to the same extent in injuries of the liver.

If the bile is aseptic there may be no peritonitis, and in

some cases spontaneous recovery has undoubtedly occurred (Martel, *Bull. de la Société de Chirurgie*, 1882).

Recovery has also occurred after the spontaneous formation of a biliary fistula (Cauchois, *Union Médicale*, 1872).

As a rule, even in cases in which the bile is aseptic, gradual emaciation occurs, ending in death, probably owing to the absorption of some toxic matter from the extravasated bile.

Septic peritonitis may occur at any time, as the bile may be already septic from previous gall-bladder disease, or infection may arise by proximity to the bowel, or after exploration, aspiration, or laparotomy. Courvoisier collected thirty-three cases, in eighteen of which the extravasated bile had been removed by aspiration. In eleven of these recovery followed. He advocated repeated aspiration before resort to laparotomy. Occasionally a single aspiration has been successful; more usually multiple aspirations are required before recovery ensues.

Terrier and Auvray (*Chirurgie de Foie*) collected seventeen cases in which aspiration (in most cases repeated) had been performed. Of these, ten recovered and seven died.

Laparotomy may be performed as a primary or a secondary operation. The former will probably be restricted to cases of penetrating wounds, while the latter will be performed in cases of subcutaneous injury. Kehr (*Centralb. f. Chirurg.*, 1892) reports a case of a man, aged thirty, suffering from a bullet wound of the gall-bladder. Immediate laparotomy, with suture of the opening, was followed by recovery. Dalton (*Transactions of Med. Assoc. of Missouri*, May, 1892) performed laparotomy for a knife wound of the abdomen resulting in prolapse of the intestine. The bowel was replaced, and both the fundus of the gall-bladder and the stomach were found to be wounded. The wounds were sutured and the abdomen drained with gauze, recovery ensuing.

Walton (*Belgique Médicale*, 1897) sutured a small wound in the fundus of the gall-bladder, but the patient died of peritonitis. The wound was found at the autopsy to be firmly closed. Secondary laparotomy will usually be performed in cases of subcutaneous rupture, owing to the

difficulties in diagnosis until jaundice appears. In many cases it will be impossible to detect the wound owing to the formation of false membrane. In these cases the bile should be washed out with saline solution and the abdomen drained.

If a small wound is found in the gall-bladder, it may be sutured or the gall-bladder may be drained through the opening. If the gall-bladder is extensively lacerated, or if the cystic duct is injured, cholecystectomy should be performed.

Dixon (*Annals of Surgery*, April, 1887), during the course of a secondary laparotomy, found the gall-bladder so extensively ruptured that cholecystectomy was necessary. At the autopsy, calculi were found impacted in the common bile-duct.

The following case (*Lancet*, May 21, 1898) of drainage of the gall-bladder, apparently thirty days after rupture, by Dr. Martin of Blackburn, is of extreme interest, and is therefore given at length :

A boy, aged nine years, was admitted to the Blackburn and East Lancashire Infirmary on November 26, 1897. Four days before admission his abdomen had been run over by a cart weighing 15 cwt. After the injury he was carried, or rather dragged, a quarter of a mile to his home. The medical man who then saw him reported that 'he was suffering from shock and pain in the right side of his abdomen, not specially confined to the liver.' Next day his symptoms were distinct abdominal swelling, slight discoloration over the region of the gall-bladder, and a temperature of 101° F. ; there was no vomiting. On the 24th there was retention of urine, and his 'bowels were moved, the motion giving marked evidence of blood.' On admission to the infirmary the boy looked very ill, and complained of pain in the abdomen, which was slightly distended, but not very tender to the touch. Nothing else was made out by physical examination of the abdomen. His pulse was 100, and his temperature was 98° F. His tongue was furred ; there was no sickness. Nothing in the way of local treatment seemed indicated, and milk with lime-water was the only food given. At 10 p.m. the temperature rose to 101·8° F. Once during the afternoon

there was vomiting of curdled milk. Next morning the abdominal tenderness had almost disappeared, and the boy looked much better. He complained of being hungry. From this time till December 2, (six days), when he was sent home, improvement was very rapid; in fact, two days before discharge he was found running about the ward during the nurse's absence for a short time. He was discharged as being 'well,' and was taken home to Accrington by an uncle, who carried him most of the way. The uncle states that in the train the boy complained of feeling ill, and when he was seen the same evening by his former medical attendant, he was 'complaining of pain in the abdomen and vomiting bilious fluid.' The abdomen had become distended again. He remained at home for twenty-one days, and during this time the stools were clay-coloured. He was sick occasionally during this time, and the abdomen remained swollen. On admission to the infirmary for the second time a great change was evident in the boy. He had lost a great deal of flesh; the abdomen was full of fluid of some kind, but was not tender. The temperature was 98° F., and the pulse was 110. The tongue was furred; there was no jaundice, neither was bile present in the urine; the stools were clay-coloured. The temperature remained normal during the second twenty-four hours after admission. On the third day the abdomen was opened in the middle line above the umbilicus by an incision 2 inches long. Nearly 5 pints of fluid escaped. This fluid, which was deeply bile-stained, was in the general peritoneal cavity, and not in any way limited by adhesions. The coils of intestine in the neighbourhood of the liver were matted together with lymph. The gall-bladder was empty, and was thought on digital exploration, to be adherent to the parietal peritoneum. A drainage-tube was left in the wound, and a bulky dressing was applied. The boy bore the operation well, and there was no rise of temperature afterwards. The dressing was removed on the second day, and found to be soaked with bile-stained fluid. The boy's general condition had improved, his tongue being moist and his pulse better. The after-history is only remarkable for the rapidity of recovery. The



temperature never reached 100° F., the discharge became less, each day, and the tube was discontinued on the seventh day. The total quantity of fluid absorbed by the dressing would almost equal the first amount removed. Bile was noticed for the first time in the fæces on the third day after the operation. The urine was examined each day for bile, but it was never detected. The daily average quantity of urine was only 20 ounces. The patient was discharged on January 1, 1898, and when seen on March 21 was quite well.

If a wound of the hepatic duct be discovered, it may be possible to close the opening by sutures. In most cases reliance must be placed on drainage.

The following case is an example of injury to the hepatic duct :

A. M., aged twenty-five, was admitted to the infirmary on May 12, 1902, having been crushed between the buffers of two trucks. He had rallied from the shock, and on admission his pulse was 70 and temperature 97° F. He had vomited several times, and complained of pain in the left hypochondrium. On examination, no distension of the abdomen, which moved freely with respiration. Some tenderness over cæcum and ascending colon. Liver dulness present. Patient passed urine soon after admission, which was free from blood.

*May 13.*—Abdomen not moving so freely. Pain over cæcum and ascending colon, with tenderness. Liver dulness present. No more vomiting. Pulse 80, temperature 100° F. In the evening dulness in the right hypochondrium, extending down into the loin and up to the chest.

*May 14.*—Area of dulness slightly increased.

*May 15.*—Patient jaundiced; bile in urine; pulse 80, temperature 100° F. Patient seemed to improve up to May 21, when the abdomen became more distended and vomiting commenced. Temperature 101° F., pulse 100.

*May 22.*—Pulse-rate rising; temperature subnormal; distension and dulness increasing; vomiting continuing.

*Operation.*—Vertical incision made over the gall-bladder, and 5 pints of fluid (bile and pus) evacuated from peritoneum. The gall-bladder was adherent, but not ruptured. As the patient's condition would not permit much exploration, the

abdomen was washed out with saline solution, the wounds were closed, a tube inserted into the pelvis, another into the right kidney pouch, and another down to the gall-bladder.

After operation the vomiting and distension continued, and the patient died from peritonitis on May 26.

At the autopsy diffuse peritonitis was found, with rupture of the hepatic duct.

Mr. Battle has reported\* the case of a boy, aged six months, who had been run over by a cab. At first there were no definite signs of visceral injury; by the seventh day, however, he was deeply jaundiced, with symptoms of acute peritonitis.

Abdominal section was done on the eighth day, and a large quantity of almost pure bile evacuated, but no injury to the bile apparatus could be detected. He died on the ninth day, and post-mortem the liver and gall-bladder were found intact, but the common bile-duct was found completely torn through.

This is apparently the first recorded case of an operation for such an accident; but in Guy's Museum, No. 1,417, is a specimen from a case of Mr. Bryant's, where there is a laceration of the hepatic duct near its origin, and in which death occurred from peritonitis after a week's illness, 2 pints of bile-stained fluid mixed with blood-clots being found in the peritoneal cavity.

In the *Lancet* for March 12, 1898, Mr. Whipple records a case of cyst in connection with the liver apparently due to the rupture of a hepatic duct.

The patient was a boy, aged sixteen, who a month before coming under treatment had been kicked in the abdomen by a horse. Immediately after the injury he had a good deal of pain, but not much subsequently. He vomited on the following day, but no record of the character of the vomited matter was kept. A week later there was observed an abdominal swelling, which gradually increased in size. On examination, there was found a large tumour about 8 inches in diameter occupying the epigastric, and parts of the hypo-

\* *Clin. Soc. Trans.*, 1894.

chondriac, lumbar, and umbilical, regions. Fluctuation could be obtained, and the tumour gave a dull note on percussion, but was neither painful nor tender. On opening the abdomen above the umbilicus in the middle line, the tumour presented, and about two pints of thin, clear, yellowish fluid were removed by means of a Spencer Wells cannula. 'The cyst was found to have extended deeply towards the transverse fissure in one direction, and towards the umbilicus to have separated widely the layers of the suspensory ligament of the liver.' When wiping the cavity, some ochry fibrinous material was removed. The lower part of the abdominal wound was closed, and the cyst wall brought up to the upper part and stitched to the parietes, drainage being effected by a tube and iodoform gauze. The boy made an excellent recovery, and left the hospital within six weeks. At that time the liver dulness was normal.

Terrier collected twelve cases of secondary laparotomy for injuries to the bile-ducts and gall-bladder, with six recoveries. If rupture of the common duct is discovered he recommends ligature of both ends of the duct and cholecystenterostomy.

## CHAPTER IV

### INFLAMMATORY AFFECTIONS

INFLAMMATORY affections may be conveniently considered clinically under the following headings :

1. Catarrhal inflammation.
  - (a) Acute catarrhal cholangitis.
  - (b) Chronic catarrhal cholangitis.
  - (c) Chronic catarrhal cholecystitis.
2. Obliterative cholecystitis and cholangitis.
3. Croupous or membranous inflammation of the gall-bladder and bile-ducts.
4. Suppurative inflammation.
  - (a) Simple suppurative cholecystitis, or suppurative catarrh, or simple empyema of the gall-bladder.
  - (b) Suppurative and infective cholangitis.
5. Acute parenchymatous or phlegmonous cholecystitis and gangrene of the gall-bladder.
6. Ulceration of the gall-bladder and bile-ducts.
7. Pericholecystitis and pericholangitis with adhesions.
8. Stricture of the gall-bladder and bile-ducts.
9. Perforation of the gall-bladder and bile-ducts.
10. Fistula of the gall-bladder and bile-ducts.

#### CATARRH OF THE GALL-BLADDER AND BILE-DUCTS.

The larger bile-ducts and the gall-bladder, being lined with mucous membrane having cylindrical epithelium and glandular diverticula, are, like other mucous passages, subject to catarrh, which may be acute or chronic.

As acute and chronic catarrhal jaundice are subjects of medical rather than surgical interest, they will only be briefly considered here; but it must not be forgotten that chronic catarrhal cholangitis, by simulating jaundice due to organic mischief, or from its frequent association with serious disease, such as cholelithiasis, pancreatitis, cancer, or hydatids, has some important surgical bearings, and that, when medical means have failed, surgical treatment must be considered.

It should also be borne in mind that the jaundice accompanying cancer of the liver is frequently catarrhal, and therefore capable of being relieved by treatment, although the original disease persists. Also, that the evanescent jaundice following on cholelithic attacks is often catarrhal, and not due to the mechanical obstruction of a gall-stone.

(a) **Acute catarrh** gives rise to the evanescent form of icterus, known as *catarrhal jaundice*, which, more frequently occurring in young persons, usually comes on as a sequence of dyspepsia or as a result of exposure to cold, and is ordinarily unaccompanied by pain or serious illness, but for which help is sought on account of the marked objective symptom of jaundice.

When it is borne in mind that the bile-ducts have only a limited calibre, that the mucous lining is capable of swelling so as to occlude the passage, and that the secretion of bile takes place under very low blood-tension (according to Naunyn, 110 to 220 minims of water), and is therefore arrested by slight backward pressure, it is easy to comprehend how catarrh in this situation should lead to jaundice, though absolute proof of the correctness of the theory is wanting, since simple catarrhal jaundice furnishes no post-mortem subjects.

*Etiology.*—An extension from the duodenum is probably the usual cause of acute catarrhal jaundice, and as the common bile-duct traverses the walls of the duodenum very obliquely, it is to be expected that the narrow terminal portion of the duct will be the first to suffer, and be the seat of the primary obstruction.

Beside gastro-intestinal catarrh, exposure to cold, extension to the bile-ducts of inflammation from the parenchyma of the liver, carcinoma of the liver, gall-stones, pancreatitis, hydatids, pneumonia, and other acute inflammations and infectious fevers, must be mentioned as causes of catarrh, direct or indirect. Murchison gives gout and syphilis as causes, and the late Dr. Fagge includes under this heading jaundice due to fright and that occurring in epidemics. Although it is well known that in cancer of the liver jaundice is a very variable sign, it is not always recognised that the icterus is at times dependent on the associated catarrh, which may be relieved by treatment, though the original disease persists. It is well known that the typhoid bacillus invades the gall-bladder and bile-ducts; hence the jaundice that occasionally accompanies enteric fever is frequently due to catarrh, and has usually been considered a rare and grave complication.

Dr. Ogilvie, in a paper in the *British Medical Journal*, January 12, 1901, gives a number of cases and tables from various authorities showing the frequency of jaundice in typhoid fever, which he estimates at  $1\frac{1}{2}$  per cent. The mortality of cases of jaundice in typhoid fever appears to be about  $12\frac{1}{2}$  per cent., but probably some of these cases may be pyæmic, or from other causes, and not simply catarrhal. There is a form of *epidemic catarrhal jaundice* known as *Weil's disease*, which, though not of interest surgically, is of great importance clinically.

The following is a synopsis from a description of the symptoms by Dr. Herbert Peck, and of the post-mortem appearances by Dr. Arthur Hall (*British Medical Journal*, December 7, 1901).

The onset is gradual, with malaise, loss of appetite, and headache. Sometimes severe abdominal pain and cramps in the calves of the legs occur. Usually vomiting comes on after two or three days. Diarrhœa is occasionally present. Temperature generally between  $100^{\circ}$  F. and  $101^{\circ}$  F.; severe rigors sometimes occur, while chilliness and shivering are always present. Jaundice usually comes on a day or two after the vomiting, though it is sometimes delayed for a

week, while occasionally it is observed earlier. As a rule the temperature falls to normal with the onset of jaundice, and remains so afterwards. The liver is, as a rule, tender, but is not often enlarged. The spleen is frequently enlarged. Complications observed in a series of sixty-nine cases were: nephritis, 1; acute pneumonia, 2; urticaria, 2; and 1 fatal case.

In the fatal case the lobules of the liver consisted of a mass of loose, shaggy, irregular connective tissue, large number of fat cells of various sizes, liver cells in all stages of fatty degeneration, some retaining their size and form, but full of minute fat globules, others granular and shrunken, and the rest of the tissue a more or less amorphous débris. The swollen interlobular bile-ducts showed distinct evidences of catarrh, the lining epithelium being overgrown, and the lumina in places completely obstructed.

The kidneys showed marked fatty degeneration of the tubular epithelium of the cortex. The microscopical appearances resemble very closely those seen in the liver and kidneys in acute yellow atrophy.

As the symptoms, diagnosis, and treatment of catarrhal jaundice are so distinctly subjects of medical rather than surgical interest, we may at once pass on to consider the chronic form, which from a diagnostic point of view has important surgical bearings.

(b) **Chronic Cholangitis**, or chronic catarrh of the bile-ducts, may be simply a sequel to the acute form, and may then give rise to a more or less persistent jaundice, leading to a suspicion of serious organic disease.

Although there are dyspeptic symptoms due to the associated gastro-intestinal catarrh, with jaundice and some loss of weight, the retention of strength and the absence of serious sequelæ, such as ascites and hæmorrhage, generally enable a good prognosis to be given, especially as the symptoms usually yield to proper treatment.

Catarrh of the bile-ducts probably always accompanies jaundice from whatever cause, and, as Dr. Moxon has pointed out, a colourless mucus is always found in the bile-ducts when an obstruction in the common duct is complete.

A search through the pathological records of Guy's Hospital for twenty years failed to discover any exception to this rule. When the obstruction is only partial, the mucus may be well charged with bile, as the backward pressure is not sufficient to stop the secretion and pouring out of bile into the ducts.

Specimen 1,420 in Guy's Museum shows dilated bile-ducts in the liver holding a pint of clear mucus (Fig. 21). There was a small cancerous growth in the common duct. Case 35 is a good example of a similar condition, but in it the obstruction was due to gall-stones.

As a concomitant of cancer of the liver or of the bile-ducts, chronic catarrh is common, and is frequently the cause of the accompanying icterus. This accounts for the relief to the jaundice afforded by treatment in a necessarily fatal disease; whereas, when the jaundice is simply dependent on the mechanical pressure of the growth in the ducts, it will be only slightly, or not at all, influenced by remedies.

The same remarks apply to hydatid disease, to abscess, and to other organic diseases of the liver.

Rolleston and Pigg (*Journal of Pathology*, vol. v.) relate a most interesting case of chronic cholangitis and pericholangitis leading to a suppurative lymphangitis in the portal spaces of the liver. Abscess formation gave rise to thrombosis and destruction of the portal veins resembling pyelephlebitis. They believe that some cases of pyelephlebitis due to gall-stones and subsequent catarrhal cholangitis are in reality examples of hepatic lymphangitis with suppuration, eventually invading and destroying the portal vein.

Cases 152, 157, and 161 are good examples of chronic catarrhal jaundice produced by the irritation of hydatid cysts in the liver, the catarrh and its accompaniment (jaundice) being cured by the removal of the cause.

Gall-stones are probably always accompanied by catarrh, giving rise to the formation of thick ropy mucus, which leads to attacks of pain when passing. Some of the minor seizures of pain not followed by jaundice—or if so, only to a slight extent—are of this nature, thus accounting for the relief that frequently follows purely medical treatment in cholelithiasis,



PLATE IV.



FIG. 21.—CHRONIC CATARRH WITH DILATATION OF BILE-DUCTS IN LIVER. CANCER OF COMMON BILE-DUCT.

(No. 1,420, Guy's Museum.)

*To face p. 60.]*



giving rise to the erroneous idea that the cause is removed, whereas the gall-stones generally remain, and at some future date may cause complications. It is quite a common event in sudden and severe gall-stone seizures occurring in middle life or in advanced age to have a history of 'spasms' five, ten, or even twenty years before, which were supposed to have been cured by olive oil or Carlsbad waters, or some other general treatment, so that in all sudden seizures in the upper abdominal region it is advisable to carefully consider the history long antecedent to the attack in question.

The following case was probably one of chronic cholangitis :

Mrs. H., aged forty-six, admitted into the Leeds General Infirmary, August 28, 1900, with a history of typical attacks of gall-stone colic for two years, with slight transient jaundice. No enlargement of the gall-bladder could be felt, but tenderness on pressure was present. No jaundice at the time of examination. The patient was given oleate of soda pills and Carlsbad salts, and careful dieting was ordered.

A letter, dated January 27, 1903, says that she has been quite free from her former attacks, and that her general health is much improved.

Although the jaundice in cholelithiasis is usually produced by a gall-stone obstructing the common or hepatic duct, it is undoubtedly true that in many cases jaundice is present when the concretion is in the gall-bladder or in the cystic duct, the obstruction to the flow of bile being caused by an inflammatory swelling of the mucous membrane of the bile channels caused by extension from the seat of obstruction ; in other words, the jaundice is dependent on catarrhal inflammation. This occurs also in many cases where, after cholecystotomy has been performed and gall-stones have been removed from the gall-bladder and cystic duct, and the common duct has been shown to be free of all concretions, all the bile flows for several days through the tube introduced into the gall-bladder—that is, until the inflammatory swelling of the mucous membrane of the common duct has had time to subside.

Riedel (*Gumprecht, Deutsch. Med. Woch.*, 1895, No. 15)

states that about two-fifths of the cases of jaundice in cholelithiasis arise in this way. He quotes one case where the gall-stone was outside the bile channel in a perforative abscess cavity, and in a case (*British Medical Journal*, May 25, 1895) seen with Dr. Chadwick at the Leeds Infirmary this was so.

The treatment of chronic catarrhal jaundice is at first medical, and if the disease prove obstinate a course of treatment at Leamington, Bath, Harrogate, or Carlsbad, will be likely to do good if the ailment be functional; but, that failing, the question of some organic cause that may be removable by surgical treatment should be considered.

Dr. Thudichum, who published a treatise on gall-stones in 1863, describes a catarrh of the finest ramifications of the bile-ducts which causes their lining to be shed in the shape of biliary casts. He considers that these often form the nucleus of gall-stones where the catarrh is associated with decomposition of bile due to bacteria invading the obstructed bile-ducts.

This has been termed by Meckel 'lithiatic catarrh'; perhaps a better term is desquamating angiocholitis, or stone-forming catarrh of the bile-ducts.

It doubtless has great etiological importance in reference to gall-stones, especially when associated with decomposition due to the presence of micro-organisms in the stagnant fluid in the ducts.

(c) **Catarrhal cholecystitis**, or chronic catarrh of the gall-bladder without jaundice, forms a distinct and definite disease, and we have seen several cases in which cholelithiasis had been diagnosed and operation advised, but where neither the gall-bladder nor ducts contained anything firmer than thick ropy mucus, which was apparently the cause of painful contractions of the gall-bladder simulating gall-stone seizures.

In one case of this kind, in a lady of sixty, the gall-bladder contained bile mixed with thick mucus, which formed plugs almost like small grains of boiled sago; there were no other signs of disease, but the gall-bladder was very large and pouched, and the mucous membrane thickened. Chole-

cystotomy was performed, and the drainage was continued for a fortnight, after which the wound was allowed to close. The patient continues well, and is freed from her previously frequently recurring attacks. (Case 101.)

Specimen No. 1,416 in Guy's Museum may be a case of this kind; it shows a gall-bladder distended with mucus, although there was no organic obstruction in the ducts. It was removed from a patient of Mr. Cock's who died from pyæmia following on acute necrosis.

In yet another case, in a lady of thirty-two, the history of gall-stones was most characteristic, and, from the adhesions found at the time of operation, there can be no doubt that at some time they had been present. At the time of operation, the gall-bladder and ducts were free from concretions, though, on opening the gall-bladder, thick mucus like that mentioned as having been present in Case 101 was found.

Cholecystotomy and drainage for a week brought about relief, and, although there was some repetition of the attacks, doubtless from the drainage not having been continued sufficiently long, persistence with appropriate medical treatment effected a cure, and the patient is now quite well. (Case 97.)

Case 165 is one of the most marked examples, and, as it occurred in a lady medically trained, who made her own diagnosis in the first instance, it has especial value, since it shows that the attacks due to catarrhal cholecystitis were equally severe with those undoubtedly due to gall-stones. In the early attacks gall-stones were passed and discovered in the motions; the attacks persisting, operation was done, and catarrhal cholecystitis only was discovered. Drainage of the gall-bladder effected a cure, and the patient remained quite well some years later.

In another instance, in a lady of fifty-five, seen in consultation with Dr. Parke of Milnsbridge, two months after a negative abdominal exploration had been made, the characteristic gall-stone attacks were persisting; and after each temporary jaundice was noticed. In this case the gall-bladder had not been drained; hence no good resulted from the operation.

Dr. Byron Robinson describes a case\* in which there were attacks of pain like cholelithic seizures, and which, he thought, were dependent on kinking of the common bile-duct, producing obstruction to the flow of bile into the duodenum, but which may probably be more readily explained on the hypothesis that it was a case of chronic catarrhal cholecystitis. It came on six months after the removal of gall-stones from the gall-bladder. On opening the abdomen, the gall-bladder, though free from stones, was found to be considerably enlarged, although the duct was patent, as proved by syringing water through it into the duodenum. Cholecystotomy resulted in recovery.

In these cases the gall-bladder is usually distended, but it rarely forms a distinct tumour, and there is an absence of pain on pressure over it. Unless gall-stones have been present at some time, there are usually no adhesions of the gall-bladder or ducts to the neighbouring viscera, proving that the inflammation has not extended through to the peritoneal coat, as it usually does when dependent on cholelithiasis.

This catarrh may be the sequence of gall-stone irritation, as in Cases 97 and 165, but in other instances may probably be due to the dependent position of the fundus of the gall-bladder, or to chronic constipation and accumulation of fæces in the hepatic flexure of the colon interfering with the regular emptying of the gall-bladder.

In all probability, in not a few of the cases where adhesions are found around a contracted gall-bladder, and no concretions are met with, the attacks are kept up by catarrh of the gall-bladder and ducts, which it is next to impossible to diagnose from the ordinary gall-stone seizures. Case III is a good example. The benefit derived from a systematic course of treatment in these cases renders it advisable that medical should always precede surgical treatment.

The diagnosis from cholelithiasis may usually be made by observing that the attacks are less severe and less prolonged than in true gall-stone seizures; that no gall-stones are found in the evacuations after an attack; that jaundice seldom

\* *American Medico-Surgical Bulletin*, April 18, 1896.

supervenes, and if it does is only very slight ; that there is no tenderness on pressure between the ninth costal cartilage and the umbilicus ; and that the affection will usually completely yield to treatment. Should medical treatment fail to relieve, it may be difficult to distinguish chronic catarrh of the gall-bladder from cholelithiasis ; but if, under the belief that the case is one of gall-stones, the gall-bladder be exposed, and no concretions found, cholecystotomy, followed by drainage, will be likely to effect a cure.

In chronic catarrh of the gall-bladder, regular exercise, massage over the hepatic region, the avoidance of anything tight around the waist which will increase the dependence of the fundus of the gall-bladder, careful regulation of the diet, and the judicious employment of saline aperients, should be in all cases adopted.

The spasmodic attacks may require the administration of a sedative, and I have found 10 grains of aspirin of great service. The dose may be safely repeated in an hour or two if required ; but in some cases, like those referred to, nothing short of a subcutaneous injection of morphia will do any good.

If, after a few weeks of general treatment, the symptoms are not relieved, the case will probably be thought to be one of gall-stones, and operative treatment may be considered advisable.

Even if the gall-bladder and ducts be found free from gall-stones, cholecystotomy and drainage should, nevertheless, be performed ; and it will be found useful after the third day to gently syringe a little warm water, previously rendered sterile by boiling, through the drainage-tube daily, so as to wash out the ducts ; and after a fortnight or more the tube may be left out, and the wound allowed to close.

General treatment directed to the cause should be continued for some time afterwards. In fact, obstinate catarrh of the gall-bladder should be treated like catarrh of the urinary bladder, first by medical and general remedies ; and these failing, physiological rest should be secured by means of drainage.

**OBLITERATIVE CHOLECYSTITIS AND CHOLANGITIS.**

It is now well recognised that repeated attacks of appendicitis may ultimately lead to obliteration of the vermiform appendix, which may be discovered as a simple cord without any lumen in the centre of firm adhesions. I have seen the condition on several occasions.

The same state may be brought about in the gall-bladder and bile-ducts by repeated attacks of inflammation, so that it is not very uncommon to find the gall-bladder and cystic duct represented by a mere fibrous cord, surrounded by adherent viscera, and unless carefully sought for, it may be thought that they have been congenitally absent, as in Case 209.

Between this form, which may be conveniently termed obliterative cholecystitis, and the ordinary contracted gall-bladder so frequently seen in operating for gall-stones, every degree of deformity may exist.

The gall-bladder may be only partly obliterated, and the small amount of mucous membrane left may continue to secrete a little mucus, and keep up a constant state of irritation resembling true gall-stone seizures, as in Case 259; or the cystic duct may be obliterated, and the gall-bladder may form a cyst containing mucus quite separated from the bile channels proper, as in Case 2. In nearly all these cases the recurring pains call for operation, and unless the apparently insignificant and almost obliterated remains be taken away, the attacks of pain, often associated with fever, will continue, and lead to serious deterioration of health. This was shown in the following case :

**CASE 229.—Cholecystotomy—Recurrence of Symptoms—Cholecystectomy—Recovery.**—Mr. S., aged fifty-six, seen with Dr. Cattle and Dr. Anderson, of Nottingham, for loss of flesh, general ill-health, and frequently recurring pains in the right hypochondrium, the illness being of several years' standing.

*Cholecystotomy, September 4, 1898.*—Contracted gall-bladder, with adhesions to surrounding parts, the result of gall-stone irritation. Cholecystotomy performed, the gall-bladder being



isolated by a gauze drain. This was followed by relief for some months, when the painful attacks recurred, accompanied by rigors and slight catarrhal jaundice.

*Cholecystectomy*.—A further operation was advised, and on September 3, 1899, the shrivelled gall-bladder, containing muco-pus, was removed, a small tube being passed into and fixed in the cystic duct. Bile flowed freely the next day. Ultimately the patient made a complete recovery, and when seen in 1902 he was in robust health, and said he had had no further trouble.

This and other similar cases of contracted gall-bladder led me to adopt the operation of cholecystectomy in certain cases, where to leave the gall-bladder means leaving a useless and diseased appendage lined with mucous membrane that is certain to secrete mucus, which is apt to be retained, owing to the cystic duct contracting and becoming strictured as the result of long-continued irritation and ulceration. This mucus, retained under tension, becomes infected, and a state of affairs much resembling chronic appendicitis is apt to continue, until either the gall-bladder undergoes atrophy and absorption, or the patient is worn-out by repeated pain and chronic septicæmia, unless a further operation is undertaken to remove the offending organ.

**CASE 22.—Removal of Gall-stone—Persistent Fistula—Cholecystectomy—Recovery.**—Mrs. S. G., aged forty-nine, operated on in 1888 for gall-stones (when sixty-six small ones were removed from a contracted and ulcerated gall-bladder and cystic duct), was left with a mucous fistula, which had to be kept open by a tube, as, if it was allowed to heal, pain and fever resulted. On May 14, 1890, a further operation was performed, when the gall-bladder was found shrivelled and adherent and the cystic duct was strictured. The operation of cholecystectomy was performed, and a complete recovery resulted, the patient being well when heard of several years later.

**CASE III.—Cholecystectomy — Recovery.**—Mr. M., aged forty-six, seen with Dr. R., of New York, and Dr. MacGeagh, of London, for frequent seizures of intense pain, resembling biliary colic, with irregular fever and great loss of flesh and

strength. At the operation on May 2, 1895, I found an inflamed and contracted gall-bladder, with cholangitis and extensive adhesions, doubtless due to gall-stones that had passed. After opening the gall-bladder and clearing away muco-pus, the organ was excised and the duct was plugged with gauze, brought to the surface through a tube. Recovery was uninterrupted, and he was able to sail at the month-end. Eight years later he was in perfect health.

So-called **congenital obliteration of the bile-ducts**, which was briefly referred to on p. 12, and is illustrated by a photograph of a specimen (Fig. 22), has engaged the attention of several pathologists. Dr. John Thomson ('Congenital Obliteration of the Bile-ducts,' Edinburgh, 1892) collected fifty cases; Dr. Rolleston has referred to nine others (*British Medical Journal*, March 30, 1901); and Dr. G. Parker (*Lancet*, August 24, 1901) to three additional ones.

The following account of Dr. Rolleston's case and his remarks on the pathogeny are so complete that I make no apology for quoting it at length:

**History.**—A male child, aged six months, had been jaundiced since birth. It was treated as an out-patient with mercury and chalk, magnesium sulphate, and podophyllin. The jaundice varied from time to time, and the child's nutrition was fairly preserved. A fortnight before death the jaundice became more marked, and on May 28, 1897, the child was admitted under Dr. Ridge Jones, to whom we are indebted for permission to publish the case.

**Condition on Admission.**—The child had universal, but not extreme, jaundice. There was some erythema in the left axilla. The liver was much enlarged, and came down to the anterior superior spine of the ilium. The spleen was also enlarged, and projected three fingers' breadth below the costal arch. There was no ascites. The urine was bile-stained and the motions clay-coloured.

On June 5 the temperature went up to 102° F., and the child died, after bringing up blood from the lungs.

The child was the first-born, and presented no signs of congenital syphilis.

**Necropsy.**—The necropsy was performed by Dr. Hayne.

PLATE V.

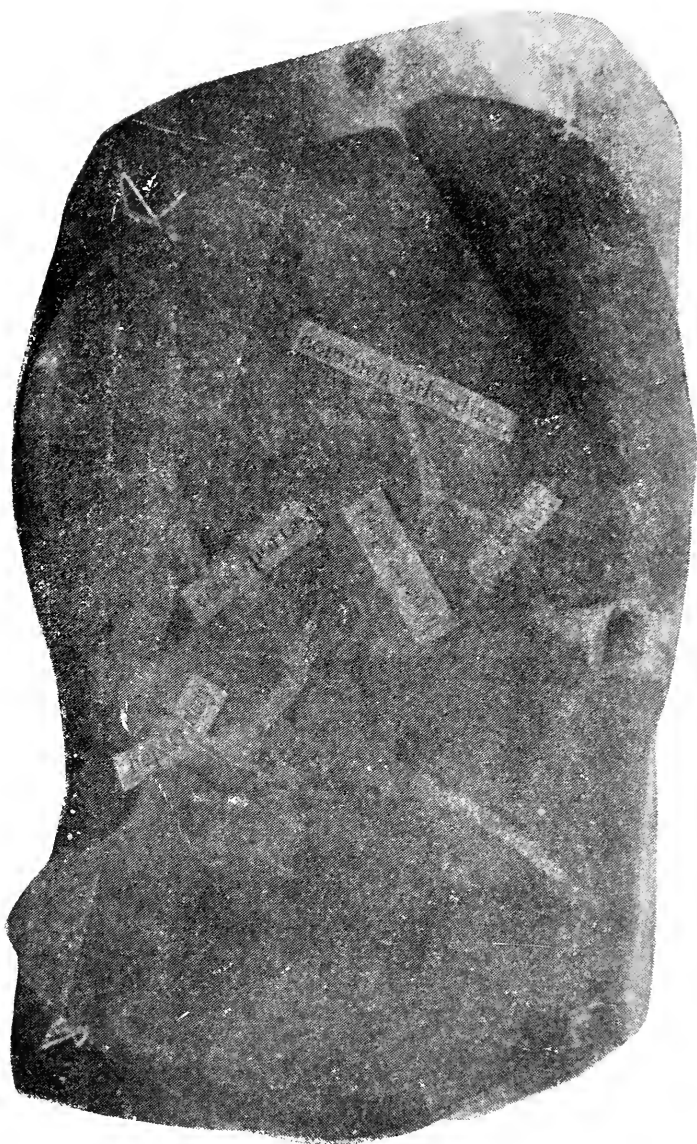


FIG. 22.—CONGENITAL OBLITERATION OF BILE-DUCTS.

(No. 973, St. Mary's Museum.)

*To face p. 63.]*



The body was thin, and all the organs and tissues were bile-stained. The œsophagus was normal, and free from staining by blood. The pleuræ were healthy. The trachea contained blood. Blood was found to have been aspirated into both lungs, which showed emphysematous bullæ and some small caseous masses; the latter were chiefly close to the surface of the lung. Microscopically, these caseous areas showed broncho-pneumonia, with early caseation, but no definite evidence of tuberculosis. One of the tracheal glands was enlarged and caseous.

**Condition of Liver.**—The liver weighed 12 ounces, or nearly twice the normal weight. Holt gives 7·5 ounces as the normal weight of the liver for a child of six months, while, according to Birch-Hirschfeld, 6 ounces is the average weight. It was much enlarged, yellow in colour, and manifestly cirrhotic. The common bile-duct was small, and as its lower half was transformed into a slender fibrous cord, considerable difficulty was experienced in finding it and in distinguishing it from the hepatic artery. The gall-bladder was small, thickened, collapsed, and buried in adhesions; the cystic duct was represented by a thin fibrous cord. There were enlarged glands in the portal fissure, suggesting the condition found in hypertrophic biliary cirrhosis. The liver cut like a cirrhotic liver, and showed fibrosis.

**Microscopic Examination.**—Microscopic sections were taken from various parts of the liver; fibrosis was everywhere present, but the appearances varied in different situations. Where the fibrosis was least marked there was monolobular cirrhosis, the fibrous tissue being old, and including a large number of newly-formed bile-ducts. In other situations, where the cirrhosis was multilobular, there were areas of extensive fibrosis, including compressed liver cells and small bile-ducts. Some of the latter were dilated, and contained plugs of inspissated bile. The cirrhosis was everywhere old and not progressive. The liver cells inside the lobules were in a very fair state of nutrition; the trabecular arrangement was disturbed, and the columns of liver cells were separated from each other by spaces, which, however, appeared empty.

The appearances are, therefore, those of a mixed mono-

lobular and multilobular cirrhosis. Sections of the common bile-duct near its obliteration show very considerable fibrotic thickening of its walls, with complete alteration of its normal appearance and absence of its mucous glands. In the lumen there is débris, consisting of inspissated bile pigment and the necrosed remains of inflammatory tissue. No trace of any normal epithelial lining can be made out. The fibrous wall is infiltrated for some distance by globules of inspissated



FIG. 23.—TRANSVERSE SECTION OF COMMON BILE-DUCT CLOSE TO ITS OBLITERATION, UNDER A LOW POWER ( $\times 35$ ).

Shows altered and fibrosed walls of duct, and absence of mucous glands and of the lining epithelium. The small black spots infiltrating the walls of the duct are microscopic masses of inspissated bile, not nuclei.

bile. In the accompanying section, drawn under a low power, the débris might at first sight suggest desquamated epithelium, but examination under a high power does not support this. The débris shows necrotic fibrous tissue, a few spindle-shaped nuclei, and small masses of inspissated bile.

The spleen weighed  $2\frac{1}{2}$  ounces, and was extremely diffuent. The heart, pericardium, kidneys, and other organs, except for bile staining, were normal.

*Remarks by Dr. Rolleston.*—This case is recorded not only

on account of its comparative rarity, but also in order to discuss briefly the nature of the morbid process.

Treves's case was successfully operated upon at the age of nineteen years for jaundice of sixteen years' duration, and obliteration and absence of the lower end of the bile-duct was found. It differs so markedly from all other cases that it might be questioned whether it belongs to the same category. Jaundice did not begin till the age of two years, instead of a day or two after birth. Possibly, though Treves does not suggest it, the obliteration of the duct was due to the effects of a calculus lodging in the duct at or about the time of the onset of the jaundice. Thomson (*Edinburgh Hospital Reports*, vol. v., 1898) considers that the same morbid process is at work in cholelithiasis in infants as in congenital obliteration of the bile-ducts, and supports this suggestion by quoting two cases of infantile cholelithiasis in which the biliary apparatus was abnormal (Cuffer, Bouisson). Treves's remarkable case may perhaps, therefore, be considered as allied to, if not a very slightly marked example of, the same class. It may be mentioned that two other cases have been operated upon, though unsuccessfully (Giese, Putnam).

**Sex.**—In Thomson's cases the sex was given in thirty-four, and showed a preponderance of males—twenty-one males, thirteen females. In the nine other cases, six were females and three males, making in all twenty-four males to nineteen females.

**Pathogeny.**—Dr. John Thomson, in his monograph on the subject, believed that in the great majority of cases there was, to start with, a congenital malformation of the ducts which narrowed the available lumen. This obstruction to the free exit of bile disposed to catarrh, blocking, and, finally, to obliteration of the ducts. As a result of the obstruction to the free passage of bile into the duodenum, biliary cirrhosis was started. In a later article contributed to Allbutt's 'System of Medicine' (vol. iv., p. 253) this writer so far modifies his views as to omit any reference to a primary congenital abnormality as a factor in the condition. The process is regarded as a descending cholangitis set up by irritative bodies in the bile, compared to toluylendiamine. When the disease has gone so far as to interfere with the

free passage of bile from the liver, biliary cirrhosis develops, as in Charcot and Gombault's experimental ligature of the bile-ducts in guinea-pigs.

Ford, in a recent paper on obstructive biliary cirrhosis, has collected twenty-four cases since 1882 where cirrhosis of the liver was associated with, and, as he believes, due to, obstruction of the common duct. Of these twenty-four cases, no fewer than nine are examples of congenital obliteration of the bile-ducts. In fact, his statistical proof that biliary obstruction *per se* induces cirrhosis of the liver rests in some measure on cases of congenital obliteration of the ducts.

It is a point of significant interest that cirrhosis of the liver is comparatively rarely found in association with obstruction of the bile-ducts in adults, and when present is usually associated with gall-stones and infection of the ducts, while cirrhosis seems to be a definite accompaniment of congenital obliteration of the ducts. In Thomson's fifty cases a microscopic examination was only made in ten, and in all but one of these it is stated that cirrhosis was present; in eight other cases that I have notes of cirrhosis was present in at least seven. The omitted case is that described by Dr. Ross, to which further reference is made below.

The question therefore arises whether there is any evidence to support the theory that cirrhosis in these cases is dependent on the obliteration of the larger bile-ducts. If it can be established that the change in the bile-duct is older and more advanced than that in the liver, there is fair ground for regarding the hepatic lesion as due to the obstruction in the ducts. In a recently recorded case Ross describes obliteration of the common bile-duct near the duodenum in a female child, aged three months, whose liver showed small-celled infiltration around the bile-ducts rather than fibrosis. In this instance it must be admitted that the evidence points to the change in the bile-duct being the older. On the other hand, in our case, and as far as one can judge in the others, the fibrosis in the liver is quite as old as the lesion in the bile-ducts. Thomson ('Congenital Obliteration of the Bile-ducts,' Edinburgh, 1892), refers to seven cases of infantile jaundice with symptoms similar to those of congenital



obliteration of the bile-ducts, but with pervious ducts; they proved fatal at seventeen days of age on an average, instead of at two and a half months, as in congenital obliteration of the ducts. 'This suggests that they are merely earlier cases of the same condition—before the blocking has occurred.'

The following hypothesis appears to be a reasonable explanation of the pathogeny of so-called congenital obliteration of the bile-ducts: In the first instance, poisons pass by the blood from the placenta to the fœtus by the umbilical vein; some of this blood at once passes through the liver, and, in virtue of the toxic effect of the contained body or bodies, induces ordinary portal or multilobular cirrhosis of the liver. The rest of the blood in the umbilical vein passes directly into the general circulation of the fœtus by the ductus venosus, and subsequently, by means of the hepatic artery, will convey poison to the liver. By this means the toxic body, which, as Thomson suggests, may be analogous to toluylendiamine, is excreted into the small intrahepatic bile-ducts, setting up cholangitis and monolobular cirrhosis, like that seen in hypertrophic biliary cirrhosis. In this way a mixed cirrhosis (portal and biliary) is induced. The cholangitis descends to the larger ducts, and gives rise to an obliterative cholangitis—a process analogous to obliterative appendicitis. The difference between this condition of congenital (umbilical) cirrhosis with obliterative cholangitis and other forms of cirrhosis in post-natal life consists in the further change in the large bile-ducts and gall-bladder. An attempt to explain this additional lesion may be made as follows: The bile-ducts are extremely small at birth, and any inflammatory change will, from the small size of the lumen, produce stenosis much more readily than later in life. An analogous effect is seen in the fact that laryngeal obstruction in diphtheria is more frequent in young subjects than in older patients, quite apart from the much greater frequency of the disease in the young. The opposed inflamed surfaces of the bile-ducts will also come in contact more readily, and, as in catarrhal appendicitis, obliteration might result. The following considerations bear on the hypothesis that the disease is primarily a congenital cirrhosis:

1. The almost constant occurrence of cirrhosis in these cases of bile-duct obstruction in infants as compared with the frequency and irregularity with which cirrhosis follows obstruction of the larger bile-ducts in later life. The mixed character of the cirrhosis explains the discrepancy in the recorded cases, some authors speaking of biliary, others of multilobular, cirrhosis.

2. The large size of the liver : this resembles hypertrophic biliary cirrhosis. In simple obstruction of the larger bile-ducts in adults, the liver, though swollen from retained bile in the early stages, is usually small after death.

3. The large size of the spleen—a phenomenon not met with in uncomplicated biliary obstruction. The large size of the spleen is best explained as the result of toxic bodies reaching the organ by the splenic artery. In hereditary syphilis, where it is probable that the poison reaches the liver by the umbilical vein, and is derived from the maternal circulation rather than that the ovum is infected by a syphilitic spermatozoon, there is a similar splenic enlargement. In both conditions there is cirrhosis due to poisons arriving by the umbilical vein; the difference between the pericellular cirrhosis of hereditary syphilis and the mixed (monolobular and multilobular) cirrhosis of so-called congenital obliteration of the bile-ducts must depend on a difference in the poisons in the two diseases. This is at one with Thomson's statistical proof that syphilis plays no part in the antecedents of so-called congenital obliteration of the bile-ducts.

4. The fact that in some instances several cases of this rare disease have occurred in the same family. Hypertrophic biliary cirrhosis not infrequently occurs in several members of the same family, and has been thought by Boix to be a water-borne disease. Against this view that so-called congenital obliteration of the bile-ducts is in reality a form of congenital cirrhosis, it might with reason be objected that the poison that sets up the change must pass through the mother, and that she should show evidence of its influence. It must be admitted that there are at present no data to provide a satisfactory answer to this argument. As bearing

Congenital absence of the Gall-bladder

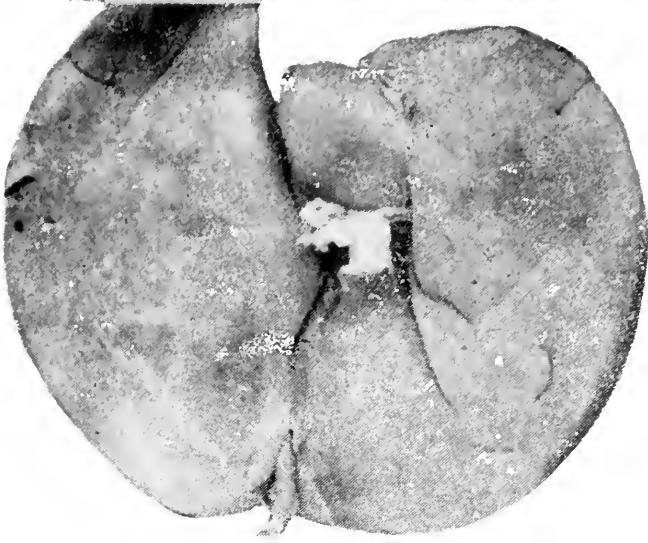


FIG. 24.  
(No. 1,390, Guy's Museum.)

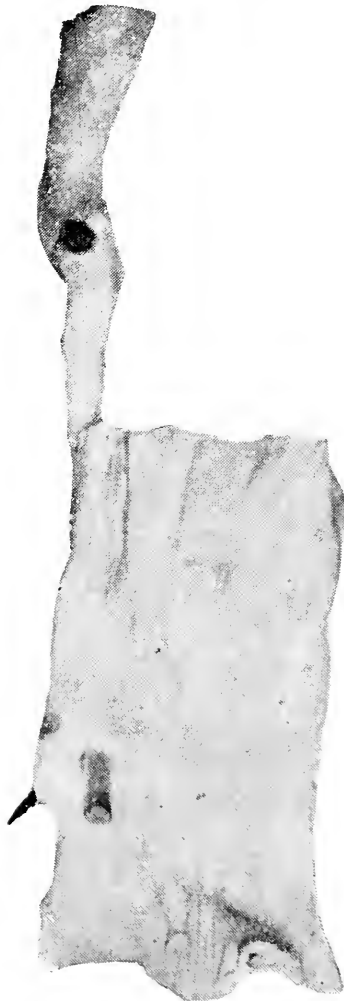


FIG. 25. —OBLITERATION OF GALL-BLADDER AND COMMON DUCT, THE  
RESULT OF GALL-STONE IRRITATION.

(No. 1,391, College of Surgeons Museum.)



on this point, however, it may be mentioned that the extremely fatal biliary cirrhosis in Brahmin infants around Calcutta, which is also a family disease, has been thought to depend on the mother's milk. The mothers restrict themselves to a dry diet and take a decoction of black pepper. If this is the causal factor, it evidently affects the nurslings more than the nurses, and might justify the suggestion that in foetal life the infant's liver may be more susceptible than the mother to poisons tending to produce cirrhosis, while again the effects of syphilis may be, and usually are, much more manifest in the infant than in the syphilized mother.

To sum up, it seems reasonable to believe that the disease is primarily started by the poisons derived from the mother and conveyed to the liver of the foetus, and that a mixed cirrhosis and cholangitis are thus set up. The cholangitis accounts for the jaundice, and by descending to the larger extrahepatic bile-ducts induces an obliterative cholangitis analogous to obliterative appendicitis.

In some cases, especially those fatal early in life, the latter change has not been effected, and cirrhosis alone is found. Possibly in some instances this change never occurs, and in this way some of the cases of cirrhosis in very early life are accounted for. Again, in exceptional instances the obliterative cholangitis might possibly be delayed, and come on much later; such an event might bring Treves's case, already referred to, into line with the others.

It is possible that there are several conditions at present included under the title congenital obliteration of the ducts, and that some, as Dr. Ross's case, are due to constriction of the duct by localized peritonitis, and deserve the title better than those cases that are intimately associated with cirrhosis.

### **CROUPOUS INFLAMMATION OF THE GALL-BLADDER AND BILE-DUCTS.**

It had been noticed as far back as 1820 by Dr. Richard Powell (*Medical Transactions* of the College of Physicians) that membranous or croupous enteritis was frequently associated with attacks simulating gall-stone seizures; and

Mr. Jonathan Hutchinson, in his 'Archives of Surgery,' in commenting on this paper, suggests that in some of these cases a *bonâ-fide* attack of gall-stone colic may have been the cause of the membranous enteritis.

From a number of cases that we have seen and observed, some of them having been submitted to operation without finding gall-stones, but where there was abundant evidence of inflammation of the gall-bladder and bile-ducts, we have formed the opinion that the cause of the painful attacks, followed by slight jaundice in these cases of membranous enteritis, is the formation of membrane in the bile passages, which, partly obstructing the bile flow, sets up spasm of the gall-bladder, just as a gall-stone or even a lump of tenacious mucus will do, as shown in the cases mentioned in the chapter on chronic catarrh of the gall-bladder, where operation was undertaken for, and led to the cure of, attacks of pain dependent on chronic catarrhal cholecystitis.

Owing to the disintegrating effect of the bile and of the intestinal secretion, it seldom happens that a true cast of the gall-bladder or bile-ducts is discovered, as occurred in the following case related by Dr. Clennell Fenwick\* of Christchurch, New Zealand, concerning a patient he had seen with Dr. Brittin.

'A. B., aged twenty-nine, has had nine attacks of biliary colic in the last fourteen months, accompanied by more or less severe jaundice. During the first two attacks he passed on each occasion a fairly large faceted gall-stone. The fæces had not been examined during the later illnesses; but from the severe pain and the symptoms, exactly resembling his earlier attacks, he feels sure that he has passed a stone on each occasion. Fourteen days ago he had a severe colic, necessitating the use of morphine, and next day passed a large piece of flesh, which was examined by his doctor, who describes it as an oblong sac with moderately thick walls, stained green, about 2 inches long and 1 inch broad, resembling the gall-bladder in shape. Ten days later he was again seized with severe pain, similar to that experienced in

\* *British Medical Journal*, April 23, 1898.

all the former illnesses, and after some hours of agony he was relieved, and next passed another cast, which I examined. It is 2 inches long, and  $1\frac{1}{2}$  inches in breadth, its walls are  $\frac{1}{16}$  inch thick; it is a closed sac with a distinct neck, and is stained bright green in parts, especially towards the neck. When laid out it appears to resemble a gall-bladder. The accompanying fæces were clay-coloured, and had been so for a long period of time. There was no microscopic appearance of hydatid structure, and I do not think that it was an intestinal cast. We came to the conclusion that both these casts were derived from the gall-bladder, as the patient had suffered from typical biliary colic many times before, and described the pain experienced before the passage of the casts as exactly similar to that he had felt before he passed the gall-stones.

‘It does not seem improbable that the presence of the stones had set up a chronic inflammation in the bladder which had resulted in the formation of a false membrane, which had itself been expelled after the last stone had been passed.’

Dr. Powell, in the paper referred to, describes the symptoms as follows :

‘The more violent seizures under which I saw all the patients consisted in a sudden and excessive pain in the epigastric region, coming on in paroxysms very frequently repeated, rather relieved by the pressure of the patient herself at the time, but leaving great soreness and tenderness during the intervals. This state continued for about four days, and during the attack the stomach was very irritable and the tongue coated and clammy. Jaundice came on at an early period, and the stools were white, brown, or somewhat greenish, and streaked in colours, until the films began to pass, when they were mixed with a full quantity of bile, but not at first of a healthy colour.’

Dr. Powell further remarks :

‘The formation of adventitious membrane has not been so frequently observed in the intestinal canal as it has in circumscribed cavities, and I know not that any description of the symptoms accompanying such a state has heretofore

been given. The appearance which comes nearest to it, both in resemblance and situation, is the membrane formed in the trachea under croup, but the symptoms are there more violent and destructive from locality of situation.

‘Whenever violent pain takes place in the epigastric region of the abdomen, exacerbating in paroxysms, accompanied by sickness, yellowness of the eyes, skin, and urine, by clay-coloured fæces, and without any proportionate increase of action in the circulation, biliary concretions are supposed to be forcing their way through the ducts, and when these symptoms abate it is inferred that their passage into the duodenum has been effected.’

After this Dr. Powell proceeds to state that he has often been disappointed in not finding a gall-stone in the fæces, and has found instead what he proceeds to describe :

‘In the cases to which I refer this residue has exhibited a large quantity of flakes, mostly torn into irregular shapes and appearing to have formed parts of an extensive adventitious membrane of no great tenacity or firmness. In the first of the cases which came under my notice, this membrane was passed in perfect tubes, some of them full half a yard in length, and certainly sufficient in quantity to have lined the whole intestinal canal. In the others also the aggregate quantity has been very large, and it has continued to come away for many days ; but it has been in irregular thin flakes of not more than 2 inches extent, and not, as far as I could discover, of the perfect tubular form (which would probably also have been broken down by the agitation in water, if it had existed on its first passage out of the body).

‘I have definitely examined four such cases, in all of whom the leading symptoms have been similar, and these have led me to suspect the passage of biliary concretions at the time. They have all been adult females, and have occurred in private practice. I had attended but one of these previous to this particular attack, and she had frequently suffered from occasional pain in the intestines and derangement of her powers of digestion, with flatulence and a sense of suffocation. She was always relieved at the time by mild opening medicine, and believed herself able to prevent the attacks.’



It is, of course, possible to have membranous enteritis and colitis without the bile channels participating; but when the combination of symptoms previously mentioned does occur, there can be little doubt that the bile-passages have become involved in the inflammatory process, and under these circumstances the symptoms will demand treatment.

*Diagnosis.*—As the symptoms so exactly resemble gall-stone attacks, the disease can only be differentiated by an examination of the evacuations, when the discovery of membranous intestinal casts will raise the suspicion of croupous cholecystitis or choledochitis. Should a cast of the gall-bladder be discovered, the diagnosis will be rendered certain, but in the absence of such positive evidence the possibility of gall-stones being also present will be entertained.

In Case 166, the patient, a man, aged thirty-six, had suffered from attacks of paroxysmal pain in the upper abdomen which exactly simulated biliary colic. No gall-stones had been found in the motions; but for some time before operation membranous casts had been found in the stools after his attacks of colic. When examined, no tumour could be made out, but the right rectus was rigid in its upper half. At the operation no gall-stones were found, but there were adhesions of the gall-bladder to the omentum, duodenum, and colon, which, in association with the catarrh of the bile passages, was quite sufficient to account for the attacks simulating gall-stones. The patient was cured by the operation, and some time later was quite well, and so far as the gall-bladder seizures are concerned, he is well at the present time, though there have recently been symptoms of membranous colitis.

Case 215 was of a somewhat similar character, but in it there was associated cholelithiasis. The patient was a woman, aged forty-seven, and her first attack of gall-stone colic had occurred about two years before operation. Similar seizures took place frequently, gradually increasing in intensity and lasting longer. Towards the end of her illness membranous casts were found in the motions.

On examination, there was the usual local tenderness, and

the gall-bladder could be felt to be slightly enlarged. At the operation there were found seventy-eight stones in the gall-bladder, cystic and common ducts, and numerous adhesions.

*Treatment.*—If under treatment by saline aperients, such as Carlsbad salts given the first thing in the morning and careful dieting, the symptoms do not abate, the question of drainage of the gall-bladder by cholecystotomy will be well worth considering (as in Case 215), and at the time of operation adhesions of the gall-bladder to the neighbouring viscera, which will probably be found, should be broken down (as in Case 166).

In both cases referred to operation was followed by marked relief, and by entire cessation of the attacks resembling cholelithic seizures, though in Case 166, after a year and a half, there was a repetition of intestinal colic, followed by the passage of some membrane in the fæces, the attack coming on as a result of exposure to cold and wet along with irregularities in diet ; but with the intestinal colic it is interesting to note that there was none of the old biliary colic.

## **SUPPURATIVE INFLAMMATION OF THE BILE PASSAGES, AND ITS RELATION TO MICRO-ORGANISMS.**

### **Suppurative Inflammation of the Bile Passages.**

At first sight suppurative inflammation of the gall-bladder and bile-ducts would seem to be capable of description in small compass and under one heading, but the subject is by no means so simple as it would appear.

For instance, simple empyema or suppurative catarrh of the gall-bladder, which is closely allied to suppurative cholangitis, differs markedly in its clinical characters from phlegmonous cholecystitis, which, however, is also associated with pus in the gall-bladder, that may quite properly be called an empyema, but which is one of the most fatal of diseases if not operated on expeditiously, as not only is there a tendency to gangrene, but to a rapidly-spreading lethal peritonitis.

The different clinical characters of suppurative inflamma-

tion can probably be accounted for by the presence or absence of certain organisms.

It has been supposed that the bile is an antiseptic fluid, which tends to prevent decomposition in the alimentary canal; but in a series of observations\* published some years ago on a case of biliary fistula it was noted that the absence of bile from the intestine of a woman during a period of fifteen months did not lead to any irregular fermentative process, showing that the alleged antiseptic effect of bile on the fæces is probably imaginary.

Normal bile is, however, generally sterile. This was proved in 1884 by Netter,† who experimented on dogs; and the fact has been confirmed by Gilbert and Girode,‡ and later by Naunyn,§ who found it sterile in two cases within a few hours of death. We have also found normal bile to be sterile in the human subject.

Frequent inoculation experiments on animals have confirmed these observations, thus explaining a well-known fact that in many cases bile has been extensively poured out into the peritoneal cavity without setting up peritonitis; but the fact of healthy bile doing no harm for a time must not lead operators to be careless of extravasation when operating for disease of the gall-bladder or bile-ducts, as in such cases the bile is seldom or never sterile, and in that condition it is capable of producing severe peritonitis.

In a case of mucous fistula following operation for stricture of the cystic duct the constant clean appearance of the edges of the fistula suggested the idea that the fluid secreted by the gall-bladder might possess antiseptic properties; and the observation that, when collecting the fluid for experimental purposes, the flasks could be left exposed to the air for several days without any apparent change suggested the same conclusion.

Professor Birch, of the Yorkshire College, who was supplied by me with some of this fluid, performed numerous

\* 'Observations on the Secretion of Bile in a case of Biliary Fistula, by Mayo Robson (*Proceedings of the Royal Society*, vol. xlv.).

† *Progrès Médical*, 1886.

‡ *Comptes Rendus, Soc. Biol.*, 1890, No. 39.

§ 'Klinik der Cholelithiasis,' 1892.

cultivation experiments, and came to the conclusion that its antiseptic properties were slight, the want of change being probably due to poverty of the fluid in nourishing materials.\*

Bloch has demonstrated that the bile in case of disease of the gall-bladder or bile-ducts always contains micro-organisms; hence he thinks it advisable to perform cholecystotomy in two stages, in order to avoid soiling the peritoneum and producing infective peritonitis.

As will be shown later when speaking of operations for gall-stones, we consider the operation *a deux temps* unnecessary, as with due care the peritoneum can be protected from being soiled by the infected bile.

When the flow of bile along the ducts is arrested, micro-organisms often invade the gall-bladder either from the blood or the intestine.

Charcot and Gombault† demonstrated organisms within it after ligaturing the common duct in dogs. This was confirmed by Netter‡ in 1886, who found that twenty-four hours after aseptic ligature of the common duct in dogs organisms (both staphylococcus and *B. coli commune*) could be cultivated from the bile. In 1886 M. Galippe found microbes in biliary calculi.

Ehret and Stolz (*Berl. Klin. Woch.*, January 6, 1902) performed several experiments on dogs to explain the sudden occurrence of inflammation in connection with chronic cholelithiasis. Sterilized hollow glass balls were inserted into the gall-bladders of dogs. About three months afterwards some of the animals were fed on decomposing food. They began to suffer from diarrhœa, and died within a few weeks, purulent cholecystitis being found post-mortem. In another series of animals small fragments of sterilized cotton-wool were inserted into the gall-bladder. Eight to ten months afterwards two of the animals, apparently in perfect health, were examined by laparotomy. The gall-bladder was thickened, and contained a number of organisms, chiefly

\* *Journal of Physiology*, No. 7.

† *Archives de Physiologie et Pathologie*, 1876 p. 453.

‡ *Progrès Médical*, 1886 p. 992.

*B. coli*. The other dogs died in from eight to sixteen weeks, and post-mortem suppurative cholangitis and cholecystitis was found. They found that, as the illness appeared suddenly long after the operation, it was probably due to auto-infection, very likely from the intestine, and they emphasize the fact of the temporarily increased virulence of the *B. coli* during an attack of diarrhœa.

The *B. coli commune* exists normally in the human body, and is said to be the most abundant and most constant of the bacteria found in man in health. It has been demonstrated in every part of the alimentary canal, from the mouth to the anus. It varies greatly in its virulence, and in experiments on animals it appears to be harmless when taken from the normal intestines. If, however, the intestine or its diverticula become the seat of any morbid conditions, then the bacterium becomes at once virulent. At one time, as shown by Escherich,\* it may act as an ordinary pyogenic organism, producing local abscesses; at another, as an active pathogenic germ, producing fatal septicæmia.

Netter† found staphylococci and streptococci present in pathological human bile, and Martha,‡ Gilbert and Girode,§ and Bouchard|| found the *B. coli commune* in the bile in cases of inflammation of the biliary passages.

Terrier states that he has proved organisms (both *B. coli commune* and streptococci) to be present in all cases of inflammation of the bile passages.¶

In acute or phlegmonous cholecystitis the walls of the gall-bladder are swollen and œdematous, and may be infiltrated with pus. In three out of five of such cases Naunyn found the *B. coli commune* in the pus.

Bonnecken, in 1890, demonstrated these organisms in the sac of a strangulated hernia, although there was no perforation, this observation having since been proved correct over and over again.

\* *Fortschritte der Medecin*, 1885.

† *Archives de Physiologie Normale et Pathologique*, 1886.

‡ *Ibid.*

§ *Comptes Rendus, Société de Biologie*, 90 and 91.

|| *Ibid.*, 1890.

¶ *Revue de Chirurgie*, 1895, p. 965.

All surgeons are familiar with the occurrence of suppurative peritonitis in cases of appendicitis, where, after removal of the vermiform appendix, the most careful examination fails to reveal any perforation. Similarly, Barbacci has shown that peritoneal sepsis may occur by infection from within the intestine without any direct communication between its lumen and the peritoneal cavity. In both these cases, however, it is probable that there is always some amount of necrosis of the epithelial lining of the gut. The spread of infection through the walls of the gall-bladder can readily be explained on the same hypothesis, showing how virulent peritonitis may arise in these cases, though there be no perforation.

Drs. Gilbert and Girode\* found typhoid bacilli in the pus from a case of empyema of the gall-bladder, which came on as a sequence of enteric fever.

Gilbert and Dominici† also assert that they produced supuration in the gall-bladder and liver of rabbits by injecting a culture of typhoid bacilli into the common duct.

Welsh and Blackstein (*Johns Hopkins Hospital Bulletin*, vol. ii., 1891) found typhoid bacilli in the gall-bladder in cases of experimental typhoid inoculation in animals. In one case the organisms were discovered in the gall-bladder on the 128th day after the inoculation, though they had disappeared from every other organ in the body.

Flexner found in 50 per cent. of fatal cases of typhoid fever the organisms in pure culture in the gall-bladder.

These biological facts are borne out by the clinical observations of Dr. Murchison and Dr. Hale White, who found evidence of inflammation and ulceration in the gall-bladder in well-marked and fatal cases of typhoid fever, there being no obstruction to the passage of bile, or other cause than the specific disease, to account for the trouble.

Chiari‡ investigated systematically a series of twenty-two cases of typhoid fever. With the exception of three cases—one of which was in the infiltrating, and two in the necrotic,

\* Biological Society of Paris, December 2, 1893.

† *Ibid.*, December 23, 1893.

‡ *Zeit. f. Heilk.*, Bd. 15, p. 199.

stage—he obtained typhoid bacilli invariably out of the gall-bladder, and in fifteen cases they were obtained in pure culture. They were generally present in considerable numbers. In thirteen of the nineteen cases in which a positive result was obtained, there was inflammation of the gall-bladder with small-celled infiltration, œdema, and hyperæmia. In all twenty-two cases the diagnosis of typhoid fever was confirmed by cultivations from the spleen, mesenteric glands, or liver, or from the larger bile-ducts.

How do bacteria reach the gall-bladder?

There are three possibilities: either they enter by the bile-ducts, or from the blood, or they reach the interior directly through the wall of the gall-bladder. The last-mentioned manner must be very exceptional, even if possible. Their entrance from the blood has been apparently proved, but it is extremely probable that they usually enter by the bile-ducts.

There is no doubt that typhoid bacilli multiply in the gall-bladder, and it is probable that they may be responsible for post-typhoidal cholecystitis and chronic catarrh of the gall-bladder and bile-ducts, as well as for the formation of gall-stones. (See Chapters on Gall-Stones and on Perforation of the Gall-Bladder and Bile-Ducts.)

### **Simple Empyema.**

Suppurative catarrh, or simple empyema, of the gall-bladder, or suppurative cholecystitis, is, as a rule, associated with gall-stones; but tumours of the bile-ducts, typhoid and other fevers, and other unexplained conditions, may also be the predisposing factors, though infection by pyogenic organisms is probably in every case the true exciting cause.

Empyema of the gall-bladder must always be looked on as a serious affection, both on account of its causes and its sequelæ, but from a clinical standpoint there is one form which is decidedly less serious than the other. The less serious will be discussed first under the term ‘simple empyema of the gall-bladder’; the more serious form will

be considered later as a distinct and special disease under the name of 'phlegmonous cholecystitis.'

When we bear in mind Charcot and Gombault's experiments on ligature of the common duct in dogs,\* just referred to, the wonder is that all impacted gall-stones are not associated with empyema; yet such is not the case, and it is only in a certain small percentage that the catarrh passes on to suppuration.

When there is an obstruction or any irritation in the cystic duct, a simple empyema may result, but when the obstruction is in the common duct, it may be associated with infective or with suppurative cholangitis; the empyema being a local suppurative process, the cholangitis an extremely serious disease, rapidly followed by general symptoms, and, unless treated by operation, usually ending fatally.

In simple empyema the symptoms will at first depend on the cause, and as this is, in the great majority of cases, cholelithiasis (Courvoisier found empyema to be caused by gall-stones in forty-one out of fifty-five cases), there will be the usual history of gall-stone seizures, followed by a swelling under the right lobe of the liver, and by a continued instead of an intermittent pain. (Cases 6, 100, 106, 134, 151, 159, etc., are good examples.)

At first the constitutional symptoms may be only slightly marked, and there may be no increase of temperature, though in the later stages, and in some from the commencement, rigors or chills with fever will point to the formation of pus. The difference in the two seems to be determined by the absence or presence of ulceration of the mucous membrane.

The patient is, as a rule, driven to bed at an early stage on account of the pain on movement. The loss of appetite, fever, and general malaise, usually lead to loss of flesh and weight. As a rule, there is no jaundice or only a slight icteric tinge, dependent on associated catarrh of the bile-ducts. Tenderness is always present, in consequence of the local adhesive peritonitis. The most tender spot is at some point in a line between the ninth costal cartilage and the

\* *Progrès Médical*, 1886, p. 996.



umbilicus, but in many cases the tenderness is diffused over the right upper half of the abdomen.

The tumour, if seen at an early stage, will move with respiration, descending with the liver, and being felt as a rounded swelling. After a time the swelling may become more diffused and general, and the movements during respiration will be less marked, or may cease, owing to inflammation extending to the abdominal walls. If the suppuration extends beyond the gall-bladder, the pus may make its way through the parietes, and an abscess may form under the right costal margin, as in the following case.

CASE 459.—Mrs. H., aged forty-eight, seen with Dr. Woodcock of Leeds, October 11, 1902. For five years she had suffered from attacks of biliary colic. Lately the pain had become more severe and continuous, and was accompanied by loss of flesh, shivering, and jaundice. During the last few weeks a swelling had appeared under the right costal margin, and the abdominal wall at length became involved. There was a large fluctuating swelling in the right hypochondriac region; the skin was reddened and oedematous.

*Operation, October 12, 1902.*—Incision gave exit to 1½ pints of pus; a sinus was found running through the abdominal parietes into the gall-bladder. This was dilated, and a quantity of pus and three gall-stones removed from the gall-bladder. The gall-bladder was drained and the abscess cavity packed with gauze. The patient made an uninterrupted recovery, and is now quite well.

The pus usually selects a more tortuous passage, and, following the suspensory ligament of the liver, it reaches the umbilicus, as in Case 79, where, in a lady of thirty-five, after a long illness, an abscess formed at the umbilicus and burst, discharging pus and mucus. There was nothing to show the origin of the trouble except a history of spasms for years, without jaundice. On laying open the fistula, a large number of gall-stones were readily removed from the gall-bladder. The patient remains in good health.

In Case 292 I was urgently summoned to operate on a supposed obstructed and inflamed umbilical hernia, which on

being opened was found to contain pus and gall-stones, the evacuation of which, followed by drainage, led to cure.

The abscess may even burst at a distance from its origin—for instance, over the pubes or over the cæcum—or it may, after setting up adhesions to adjoining viscera, be discharged into the duodenum, colon, stomach, or pelvis of the kidney; or, passing into the liver, it may lead to abscess of that organ; or, perforating the diaphragm, it may discharge into the pleura and set up empyema, or into the pericardium and incite pericarditis, or into the peritoneal cavity and produce acute general peritonitis.

There are generally peritoneal adhesions which prevent extravasation into the general peritoneal cavity; but the pus may make its way into neighbouring organs, as in Case 27, where it burrowed into the liver and formed an abscess, which was evacuated at the time of operation. On several other occasions I have found a cavity in the liver containing pus and gall-stones communicating with the diseased gall-bladder.

Quite recently I operated on a patient, aged twenty-six, who for several years had been coughing up  $1\frac{1}{2}$  pints of offensive pus and bile daily, which has ceased after the removal of a gall-stone from the hepatic duct. (Case 508.)

In King's College Museum, No. 1,706, is an example of a gall-stone which was removed from the pleura of a patient by Professor Rose, and as the patient had coughed up a quantity of bile-stained pus, an empyema of the gall-bladder had probably burst through the pleura, though no communication could be discovered after death, which occurred a few weeks after operation.

In one case that I saw with a colleague a large subphrenic abscess, caused by an empyema of the gall-bladder becoming extravasated between the liver and diaphragm, was successfully evacuated and drained.

If we bear in mind the pouch of peritoneum in front of the right kidney, it is not to be wondered at that a collection of pus should at times form in that region resembling a perirenal abscess, though inside the peritoneum and limited by adhesions. (Case 212 is an example.)

Needless to say, an abscess of the gall-bladder only requires treating on general surgical principles by opening and drainage; but, at the same time, the cause must not be overlooked, as it may often be removed at the same time that the abscess is evacuated.

Where the pus is in the gall-bladder, cholecystotomy will be advisable. After exposing the gall-bladder, it will be wise to aspirate before opening it, in order to avoid soiling the tissues with pus.

The walls of the gall-bladder may be found so friable as to be incapable of holding sutures, or there may be small abscesses in the inflamed wall of the gall-bladder itself; in such cases cholecystectomy may be required. In two cases of empyema of the gall-bladder, after the pus had been evacuated and the gall-stones removed, the cavity was packed with iodoform gauze, and although the peritoneal sac was widely opened, no harm resulted, as a lymph barrier was soon thrown out, limiting the only partly disinfected area.

In abscess due to empyema of the gall-bladder, reaching the surface at some distance from the seat of origin, it may be wise at first simply to open and drain the abscess, and on some future occasion to perform cholecystotomy or cholecystectomy. This was the course successfully followed in Case 109.

But it may be feasible, as in a case mentioned above, after opening the superficial abscess, to dilate the fistula leading to the gall-bladder and remove the stones, afterwards leaving a tube in the gall-bladder. This may be effected without detaching the adherent gall-bladder from the surface.

In some cases of empyema the patient may not be in a fit condition to bear a prolonged operation, and it may therefore be wiser to perform a simple cholecystotomy and to defer the removal of the cause until an examination of the discharge shows it to be sterile or nearly so.

## ACUTE PHLEGMONOUS CHOLECYSTITIS AND GANGRENE OF THE GALL-BLADDER.

Acute or phlegmonous inflammation of the gall-bladder was described by Courvoisier in 1890, under the name of acute progressive empyema of the gall-bladder, and he states that it usually terminates fatally in a few days from diffuse peritonitis. Only seven cases are regarded in Courvoisier's statistics.

Potain\* also mentions that, in addition to the ordinary variety of empyema of the gall-bladder, there is a very grave condition of acute empyema, which is followed by rapid peritonitis and death. In one case, which he describes, death occurred on the second day after the onset of the attack, and although there was no perforation of the walls of the viscus, infection had spread through the coats to the general peritoneal cavity.

Osler† refers to it as an extremely rare disease.

A case described by Mr. W. Arbuthnot Lane‡ affords a good example of phlegmonous inflammation simulating acute intestinal obstruction, or acute pancreatitis.

A man, aged fifty-four, was suddenly seized with abdominal pain immediately after a rather hearty meal.

This continued, and was accompanied by frequent vomiting. Next day the vomiting became less frequent, and then ceased; ingestion of food, however, caused much distress and renewed vomiting.

The abdomen became much distended, and both pain and distension were now marked on the right side.

These symptoms increased in severity till the fourth day of the illness, when Mr. Lane first saw him. The bowels had not moved since the onset. He was now in a very prostrate condition, with a small rapid pulse and a very distended, painful, and tender abdomen, the hardness and fullness being most distinct about the right hypochondriac region and its vicinity.

\* *Journal de Médecine et Chirurgie*, November, 1882.

† 'Principles and Practice of Medicine.'

‡ *Lancet*. February 25, 1893.

There was no previous history of gall-bladder trouble nor of intestinal obstruction.

From the distended condition of the small intestines and cæcum, with the collapse of the colon on the left side, the case was supposed to be one of obstruction about the hepatic flexure.

On opening the peritoneal cavity, a very thick layer of firm lymph, covering the edge of the liver and extending down over the adjacent transverse colon, was found, beyond which the colon was empty, contrasting with the distended condition of the proximal part of the bowel.

In immediate relation with the transverse colon and the duodenum, which was also covered with lymph, was found a tensely distended, livid gall-bladder, which was not larger than normal, and was evidently very acutely inflamed.

The whole of the lymph was carefully removed and the gall-bladder tapped of its contents, which consisted of thick muco-pus. The opening was then enlarged, a drainage-tube inserted, and the margins of the wound stitched to the peritoneum. No gall-stone was discovered. The patient made a complete recovery.

In the *Lancet*, March 2, 1895, is a case reported by Mr. Marmaduke Sheild, which is more fully described under perforation of the gall-bladder, but which was doubtless a case of phlegmonous cholecystitis following on typhoid fever, in a woman, aged thirty-one, under the care of Dr. Monier Williams.

She was operated on on the fifty-first day of the disease, when the gall-bladder was found to be rigid, thickened, and of a dark plum colour, containing  $1\frac{1}{2}$  ounces of thick, offensive pus; it was ulcerated and perforated. The abdomen was washed out and drained, complete recovery ensuing.

No. 2,806 in the Hunterian Museum is a case of typhoid cholecystitis, probably phlegmonous, as the peritoneal coat had much false membrane on it and pus was found in the gall-bladder. It is from a case of typhoid fever, in which death occurred in the fourth week.

Case 176 is a good example of acute phlegmonous cholecystitis in a man, aged forty-seven, who had suffered from

gall-stone attacks for some years, had been severely ill for six weeks, and very acutely ill for six days before operation.

The symptoms were those of an acute attack of local peritonitis in the region of the gall-bladder, with fever, depression, and general malaise, following on a severe gall-stone seizure. When exposed, the gall-bladder was found of a dark plum colour, with one or two greenish patches on its surface. It contained malodorous pus and nine gall-stones. The omentum and adjoining coils of intestine were coated with lymph, thus limiting the inflammation to a comparatively small area.

The concretions were removed and all the pus wiped away before the general peritoneal cavity was opened. Under free drainage the patient made an excellent recovery, and is now well.

Another case (No. 194), in which the symptoms were subacute and dependent on gall-stones, illustrates the intermediate stage between ordinary empyema and acute phlegmonous cholecystitis. The gall-bladder was dark-coloured, covered with lymph, and contained offensive pus. Removal of the gall-stones and drainage led to complete recovery, and the patient is now quite well.

*Etiology.*—Although the condition is usually associated with gall-stones, acute cholecystitis may arise quite independently—in this way resembling appendicitis, which may occur without the presence of concretions or foreign bodies.

Typhoid and typhus fevers, cholera, malaria, sepsis after operation, puerperal fever, and other unknown conditions may give rise to it.

*Symptoms.*—Whatever be the cause, the disease usually manifests itself somewhat suddenly, with pain on the right side of the abdomen, rapidly becoming general. A rapid and feeble pulse, quick thoracic breathing, fever, intense depression, marked tenderness on pressure (especially over the right side of the abdomen), rapidly developing tympanites, vomiting, and an extremely anxious expression of countenance, are usually present.

The acute peritonitis, which is significant of the disease, may be localized at first, but later becomes general.

Jaundice may or may not be present, and although an elevation of temperature is usual, it is by no means constant, and affords only slight assistance in the diagnosis or prognosis.

If the disease be of the very acute or gangrenous variety, death speedily occurs; but if of the subacute form, an abscess may develop around the gall-bladder, and the peritonitis may become localized, the disease then resembling a perityphlitic abscess in its course.

*Diagnosis.*—The diagnosis of phlegmonous cholecystitis practically resolves itself into the diagnosis of the cause of acute peritonitis, starting on the right side of the abdomen.

Although this may be due to perforation of the stomach at or near the pylorus, to perforation of the duodenum or ascending colon, to perforation of the gall-bladder or bile-ducts, and to other suchlike peritoneal catastrophes, the chief affection for which it is likely to be mistaken is acute appendicitis.

In some cases the normal descent of the cæcum into the right iliac fossa does not take place. The cæcum and colon, with the appendix, are found in the right hypochondrium in close relation to the gall-bladder. A few cases have been recorded in which this relation was present, and an attack of appendicitis led to the development of an abscess beneath the right costal margin. Such a case would give rise to great difficulties in diagnosis, and it might be impossible to say until the abdomen was opened whether the condition was due to gall-bladder trouble or to appendicitis. In appendicitis the pain usually begins around the umbilicus, and is subsequently referred to the right iliac fossa, or it may start at a lower point in the abdomen and pass towards the umbilicus; whereas in gall-bladder trouble it begins below the right costal margin, and passes towards the epigastrium and back to the right scapular region.

In gall-bladder inflammations there is almost invariably a tender spot a little above and to the right of the umbilicus, or, to be more exact, at the junction of the upper two-

thirds with the lower third of a line drawn from the ninth rib to the umbilicus, or it may be all along this line or at any point of it, though at the point named it is the most frequent.

It will be found that this point is tender both to touch and to pressure, it being in reality the site of a reflected pain passing along the splanchnic to the eighth and ninth right dorsal nerves, and thence reflected to the surface termination of these nerves. Even when the gall-bladder is displaced, owing to deformity or enlargement of the liver, so that it is placed at a distance from its usual position, I have found this spot to be tender on pressure, thus affording a valuable means of diagnosis.

As a rule, besides this point of tenderness, a peculiar sickening pain will be felt on direct deep pressure over the gall-bladder itself, usually just below the right costal margin, but in case of displacement of the gall-bladder the pain on deep pressure may be as low as the iliac fossa.

When gall-stones are in the common duct, the pain on deep pressure is generally above the umbilicus, nearer to or even in the mid-line.

In appendicitis there is in the same way a tender spot at the junction of the outer third with the inner two-thirds of a line drawn from the umbilicus to the anterior superior spine of the ilium, known as McBurney's point.

The symptoms of acute peritonitis and paralytic obstruction of the bowels are common to both. Fortunately, the treatment by exploratory incision is appropriate to both; but it is important to distinguish between them, as if the incision is made over the gall-bladder in a case of appendicitis, or *vice versá*, an abscess may be opened through the unaffected peritoneum, and give rise to general peritonitis.

*Treatment.*—Relief of pain by subcutaneous injections of morphia will probably always be demanded as a primary measure, and as it is often impossible to make a diagnosis of the serious condition within the first few hours, warm applications should be used, and absolute rest enjoined, all feeding by the mouth being stopped, and the relief of symptoms as they arise being attended to; but as soon as



the diagnosis of phlegmonous cholecystitis can be established, and it is found that the patient is getting worse, an exploratory incision should be made, and the gall-bladder incised and drained, the cause, if found, being removed.

If, however, gangrene be discovered, the gall-bladder should be excised, the indications for that measure being as distinct as in the case of a gangrenous vermiform appendix.

If, in the subacute cases, the inflammation becomes localized, and a swelling with tenderness be found beneath the right costal margin, incision and drainage is called for, when at the same time cholecystotomy may be performed, and if gall-stones be present in the gall-bladder or ducts, they may be removed. If the patient be too ill to bear a prolonged operation, the latter procedure may be left to a subsequent occasion.

**Gangrene of the Gall-bladder** is an extreme degree of phlegmonous cholecystitis.

The comparative frequency of gangrene in the vermiform appendix might lead one to suppose that gangrenous inflammation of the gall-bladder would not be uncommon; yet it is apparently rarely seen, the case reported by Dr. L. W. Hotchkiss in the *Annals of Surgery*, February, 1894, being the earliest operation for gangrene of which we can find any record.

Case 176, mentioned on page 91, is an instance of phlegmonous cholecystitis passing on to gangrene.

Since the publication of the last edition of this work I have operated on a well-marked case of gangrene of the gall-bladder.

CASE 299.—Mr. M. A., aged fifty, seen with Dr. Tempest Anderson of York, January 10, 1900, for acute local peritonitis of a week's duration, starting in the region of the gall-bladder, and ushered in by a rigor, followed by fever and intense pain and prostration, the first symptom of pain in the gall-bladder region having only been noticed a month previously.

The operation was performed on January 10, 1900, when gangrene of the fundus of the gall-bladder was discovered, with intense local peritonitis, limited by acutely inflamed

and darkened omentum, the patient being a very fat subject. Cholecystectomy performed; the portion of gall-bladder attached to the liver was left, as it was not gangrenous; a tube was inserted into the cystic duct. He made an uninterrupted recovery, and is now in excellent health.

In Guy's Hospital Museum there is a well-marked specimen of gangrene of the gall-bladder (N<sup>o</sup>. 1,397). The mucous membrane is dark brown, and there are gangrenous patches on the serous surface. The common duct was obstructed by growth, and the patient, who had been under the care of Dr. Moxon, had been jaundiced for three months.

In Dr. Hotchkiss's case, a boy, aged nineteen, was admitted to the Belle Vue Hospital, New York, with acute peritonitis, which had come on suddenly, and was thought to be due to appendicitis, as the pain was most severe over the cæcal region. No previous history of gall-stones was obtainable.

Exploration of the abdomen revealed a tumour of purplish hue, very tense, and markedly congested. Some pus was found on its outer side, and within it thin, sticky fluid of a yellowish-brown colour, together with a number of gall-stones. The lower end of the gall-bladder was almost black, and its walls extremely thin and apparently gangrenous.

Death occurred seven hours after the operation, and thirty-four hours after the onset of the attack, the vomiting, rapid pulse, and high temperature continuing to the end.

In order to explain the occurrence of gangrene, three factors have to be borne in mind :

- (a) Thrombosis of the nutrient vessels.
- (b) Bacterial infection.
- (c) Absence of drainage (and therefore tension).

The two latter are present in both gall-bladder and appendix inflammation, but the first factor is more frequent in the vermiform appendix, which is only supplied by one nutrient artery, whereas the gall-bladder has a very free blood-supply, not only through the branches of the cystic artery, but also

through their anastomoses with the hepatic vessels, where the gall-bladder is fixed to the liver.

In Dr. Hotchkiss's case there was an abnormal circular constriction of the gall-bladder with lymph infiltration, which was apparently sufficient to cut off the blood-supply from the extremity of the gall-bladder.

In my own cases the intensity of the infective process apparently accounted for the gangrene, as there appeared to be no unusual constriction in the gall-bladder itself, and in one case not even gall-stones were present, the cause of the inflammation not being apparent.

### INFECTIVE CHOLANGITIS.

Infective cholangitis, or infective catarrh of the bile-ducts, was first described by Charcot under the name of intermittent hepatic fever. It is usually due to gall-stones in the common duct, which favour the entrance of organisms from the intestine through the duodenal orifice; but anything causing obstruction of the common or hepatic ducts may lead to infection of the retained bile. Thus, I have known infective cholangitis to follow on chronic pancreatitis, cancer of the pancreas, cancer of the common bile-duct, hydatid disease, lumbrici in the bile-duct, pancreatic calculus and stricture of the common duct, besides general ailments such as typhoid fever and influenza.

Courvoisier, Osler, and Fenger have each described the ball-valve action of gall-stones in a dilated common bile-duct, thus accounting for the intermittent character of the jaundice and the irregular course of the disease.

Although this condition, in which the gall-stones are freely movable or even floating in the common duct, does give rise very frequently to infection of the bile-ducts, the fixed concretions, single or multiple, are, in our experience, equally potent in setting up infection, for in the latter case ulceration is frequently associated.

The usual history is one of 'spasms' for several years, without jaundice; then comes a more severe seizure, followed by temporary icterus. If the gall-stone passes, there is an

end of the trouble; but if not, the next attack of pain is probably immediately followed by a shiver, and by all the symptoms of an 'ague fit,' the temperature frequently reaching  $104^{\circ}$  or  $105^{\circ}$  F. After it has passed off, the skin is more deeply tinged, and the jaundice may persist, though it varies in degree; it rarely, however, completely disappears between the attacks, there being usually a slight icteric tinge of the conjunctivæ, even though the interval between the attacks may be one of weeks or months. The rigors may be repeated daily, or at irregular intervals.

The gall-bladder may be felt as an enlargement below the right costal margin; but this is not usual, as where there are gall-stones it is more common to find the gall-bladder contracted. The liver at first is not enlarged, but later its lower margin may descend considerably.

Tenderness over the gall-bladder or in the epigastric region can generally be elicited. There is usually well-marked loss of flesh and strength, and if unrelieved by Nature or art, the disease may run on into suppurative cholangitis and its complications.

Infective cholangitis may persist off and on for years, and may end in recovery; but, on the other hand, it may assume an acute form, and lead to death from pain, biliary toxæmia, and exhaustion. The complications which may follow are suppurative cholangitis, diffuse hepatitis, abscess of the liver, cirrhosis of the liver, pyelephlebitis, cholecystitis and empyema of the gall-bladder, perforation of the ducts, acute, subacute, or chronic pancreatitis, endocarditis, pleurisy, pneumonia, and other septic diseases.

*Diagnosis.*—Ague, being rare in England, is not so readily thought of as it is in countries where malaria is endemic; but the regularity of the chills, and the slight jaundice and enlargement of the spleen in some cases, will usually suggest it, though the pain and tenderness, the history of cholelithiasis, and the absence of relief by large doses of quinine, soon settle the doubt. As infective diseases in the bile passages are prone to end in suppuration, abscess of the liver and suppurative cholangitis may supervene; but the more prolonged course of infective cholangitis, the compara-

tive good health between the attacks, the irregularity in the course of the disease, and the absence of rapid and progressive deterioration of health, will usually enable a diagnosis to be made, though the loss of flesh may be remarkably rapid, especially if the pancreas becomes involved. When suppuration exists, there are usually increased tenderness over the liver area, continued or irregular intermitted fever, and intense and persistent jaundice.

The following cases afford examples of infective cholangitis caused by gall-stones.

CASE 411.—Mr. W., aged sixty-one, seen with Dr. Clampitt, of Bootle. For ten years subject to attacks of biliary colic, which lately had become more frequent and associated with ague-like attacks, with distinct jaundice and loss of flesh. Jaundice well-marked after each attack, but diminished in the intervals. No enlargement or tenderness of the liver, or gall-bladder could be felt.

*Operation, January 20, 1902.*—Choledochotomy: one gall-stone removed from the ampulla of Vater. Cholecystotomy for drainage.

Patient made a good recovery, and in June, 1902, had gained  $2\frac{1}{2}$  stones in weight.

CASE 410.—Mrs. G., aged forty-four, seen with Dr. Wilson Smith, of Bath, for attacks of biliary colic off and on for several years. During the last six weeks she had had several attacks, associated with jaundice, shivering, and loss of flesh. On examination, no enlargement of the liver or gall-bladder could be found. Mitral disease and albuminuria.

*Operation, January 17, 1902.*—One stone in ampulla of Vater removed by choledochotomy. Cholecystotomy performed for drainage of bile-ducts.

Patient recovered, and, so far as the abdomen is concerned, is now quite well.

CASE 417.—Mrs. D., aged forty-four, seen with Dr. Temperley Grey, of Lenham. Two years ago patient had an attack of biliary colic, and was ill for some time. She had had numerous attacks since, usually associated with rigors and fever, and one very severe a month ago associated with deep jaundice, which persisted. No enlargement of liver or gall-

bladder; some tenderness on deep pressure could be felt to the right of and above the umbilicus. Great loss of flesh.

*Operation, February 19, 1902.*—Duodeno-choledochotomy: one gall-stone removed from the ampulla of Vater. One stone removed from gall-bladder by cholecystotomy.

Patient made a good recovery, and is now well.

*Treatment.*—If possible, the cause should be removed; but should this prove impossible, the ducts can be drained. Fortunately, this may be accomplished with every prospect of success if, as is commonly the case, the disease be gall-stones. Cases 56, 57, 92, 136, 153, 161, and 162, etc., are good examples.

There can be no doubt in the minds of those who have observed many of these cases that it is better to anticipate the complication, and as soon as medical treatment has been fairly tried and failed, the removal of gall-stones by surgical means should be resorted to before infection of the bile passages has occurred.

### SUPPURATIVE CHOLANGITIS.

**Suppurative Cholangitis**, or Suppurative Catarrh of the Bile-ducts, is a subject of deep interest, and the disease of serious import, not only on account of its causes, but from the combined effects of biliary obstruction and stagnation, with septic infection, and their local and constitutional effects.

*Etiology.*—Cholelithiasis is by far the most common cause, and in the museums there are several cases illustrating it. Specimen No. 1,418 in Guy's Museum shows dilated hepatic ducts containing pus and many dark-coloured gall-stones, the ducts throughout the liver being inflamed and dilated, and there being several abscess cavities; one gall-stone is free in the common duct. The specimen was taken from a woman, aged thirty, who had had enteric fever five months before death. At first she had an enlargement of the gall-bladder, which, however, disappeared. Death occurred from pyrexia, accompanied by rigors.

Case 236 affords a good example of infective cholangitis, dependent on gall-stones, passing on to suppurative cholangitis, in which, although the gall-stones were thoroughly

removed from both the common and hepatic ducts, and the pus and infected bile freely evacuated, the patient, who had heart disease and albuminuria, was too far reduced by her illness to withstand the operation, which offered the only chance of recovery.

Case 12 is interesting as being a well-marked case, in which the disease was dependent on gall-stones, followed by cancer of the common bile-duct. Though temporary relief was given by drainage, the patient ultimately succumbed to the disease, and at the autopsy the bile-ducts throughout the liver were found full of pus.

Case 287 is one of gall-stone in the common duct producing chronic pancreatitis and suppurative cholangitis, in which, on account of the extreme illness of the patient, a cholecyst-enterostomy was performed as being a more rapid operation than choledochotomy at that time, whereas now, by adopting the method of liver rotation, I should have performed choledochotomy in even less time and with better ultimate results.

A man, aged forty-five years, from Queensbury, was admitted to the Leeds General Infirmary under my care on November 3, 1899, suffering from jaundice, with repeated attacks of pain and ague-like seizures. He had been well up to thirteen months before his admission, when the attacks began, and since their onset he had lost 6 stone in weight. Jaundice followed the first seizure and persisted, but after each attack of pain it was more intense. He was so weak and ill that it was feared he could not bear the operation. An enlargement of the right lobe of the liver could be felt, and on its inner side, in the mid-line just above the umbilicus, there was another tumour situated behind the stomach. On November 9 an operation was performed on a heated table with the patient enveloped in wool, an injection of 10 minims of solution of strychnia having been previously given. On opening the abdomen, an enlargement of the right lobe of the liver was seen; the gall-bladder was found shrunken under adhesions, a floating gall-stone too hard to crush was felt in the common duct, and a hard nodular tumour of the head of the pancreas was discovered. As the latter was thought to be malignant and the patient was extremely feeble,

choledochotomy was not performed, but the gall-bladder was connected to the duodenum by a Murphy's button, in order to give temporary relief to the jaundice, fever, and pain. He had a severe rigor on the night of operation, but afterwards progressed satisfactorily and recovered from the operation. The button passed on the twelfth day, and as he had gained some weight and was taking his food well, it was thought that the operation was going to be of real benefit to him. The subsequent history of the case was as follows: On December 8 (a month and a day after operation) he had a feeling of chilliness, and a temperature of 101° F. followed for two days, his temperature afterwards being normal for twelve days, when he had a rigor and a return of the jaundice; from this time, although he got up every day, he gradually became weaker, and in January, 1900, he developed bronchitis, which ushered in the final scene. At the post-mortem examination the peritoneum was found to be free from inflammation, and the gall-bladder was found to be connected to the duodenum  $1\frac{1}{2}$  inches beyond the pylorus, but the opening had contracted so that it would only admit a fine probe. The common bile-duct was dilated and ulcerated, and it contained a gall-stone of the size of a filbert. The liver was considerably enlarged, and the right lobe was occupied by an abscess containing thick, slimy muco-pus. The walls of the abscess cavity were ragged and ill-defined, and it reached nearly to the surface both in front and behind. It was doubtless the result of the suppurative cholangitis which was present. The head of the pancreas was much indurated, and together with the indurated tissues in the small omentum presented on palpation the sensation of a tumour. On section it presented to the naked eye the appearance of chronic inflammation rather than growth, and on microscopical examination this view was confirmed, there being a great excess of interstitial fibrous tissue, but no sign of cancer.

Besides gall-stones; hydatid disease, ascarides, cancer of the bile-ducts, typhoid fever, and influenza may cause suppurative cholangitis, and it is probable that the disease not infrequently complicates other acute infectious ailments.



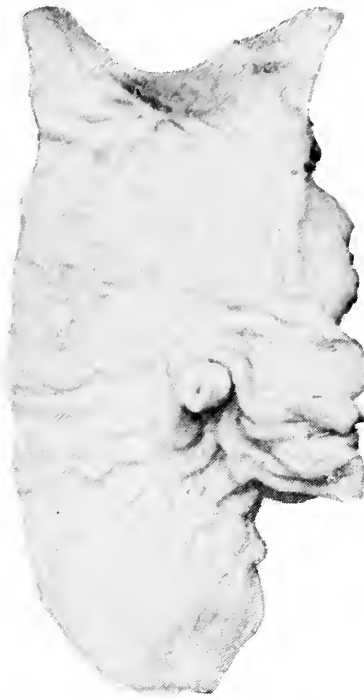


FIG. 26.—HYDATID, ROLLED UP AND BLOCKING COMMON BILE-DUCT, PORTION PROJECTING INTO DUODENUM.

Taken from a boy of fourteen, who had a large hydatid cyst in right lobe of liver. Death from suppurative cholangitis. (No. 2,252, St. Bartholomew's Museum.)



FIG. 7.—INFECTIVE CHOLANGITIS, SHOWING DILATED INTRA-HEPATIC DUCTS.  
Cause: cancer of ampulla of Vater (No. 1,307A, St. Thomas's Museum.)



**Hydatid Disease** causing infective cholangitis is apparently not rare, as the specimens in many of the museums show.

No. 2,252, St. Bartholomew's Museum, shows a hydatid membrane rolled up and blocking the common bile-duct, a portion of it projecting into the duodenum. There was a large hydatid cyst in the right lobe of the liver. It was taken from a boy, aged fourteen, who died from jaundice, accompanied by pain, fever, and delirium. Three months before death he is said to have had hepatitis (Fig. 26).

No. 1,384, Guy's Museum, shows a hydatid cyst opening into the hepatic duct, a piece of hydatid membrane projecting through the papilla into the duodenum. The ducts throughout the liver are dilated and filled with pus. It occurred in a man of fifty, who had had jaundice a month before admission, and died a week after.

No. 196A, St. George's Museum, and No. 1,582, Middlesex Museum, are also examples.

Case 161 of my series affords an example of successful operation for infective cholangitis dependent on hydatid disease, and Case 532 is an example of infective cholangitis and chronic pancreatitis dependent on hydatid disease.

Mr. Jonathan Hutchinson, junior, has also told me of another case in which he operated on a young woman suffering from intense paroxysmal pain, with high temperature and sickness, in whom the gall-bladder could be felt as a very tense tumour. Cholecystotomy was performed, and numerous hydatids let out. An opening could be felt between the cyst in the liver and the gall-bladder. Pus escaped with the bile for a time, but the patient is now well.

**Ascarides in the Bile-ducts.**—Mertens has collected\* forty-eight cases in which ascarides have been found in the bile-ducts. In only five cases were there symptoms pointing to the presence of gall-stones, and in two only was the cause of the symptoms determined during life. Mertens' patient, a woman, aged thirty, was admitted into hospital after her third attack of biliary colic, which simulated closely an ordinary gall-stone seizure, beginning with pain in the gall-bladder region, associated with vomiting and followed by

\* *Deutsche Med. Wochenschrift*, 1898, No. 23.

jaundice. On admission, both the liver and spleen were enlarged, and the gall-bladder could be made out, though it was not tender. There was present almost complete obstruction to the flow of bile into the intestine. Pleurisy with effusion occurred on the right side, and was followed by the development of ascites and œdema of the legs. The patient rapidly lost strength for seven weeks, and the jaundice became very marked. Then two partially macerated round worms were found in the stools, and the patient rapidly began to improve, ultimately getting quite well.

The other case, the cause of which had been diagnosed during life, showed the ordinary signs and symptoms of suppurative cholangitis; but, in addition, round worms were vomited and also found in the motions. The child ultimately died, and post-mortem examination revealed dilated bile-ducts, with multiple abscesses in the liver.

Mertens' supposition, that the worms were enabled to enter the common duct from the duodenum by reason of the ducts having been dilated by the previous passage of gall-stones, seems to be the most likely explanation of their presence in such an unusual situation.

Ogilvie (*British Medical Journal*, January 12, 1901) reports a case of a girl, aged sixteen, who developed jaundice during the first week of an attack of typhoid fever. After some days a round worm, a third of which was stained with bile pigment, was passed in the motions, and the jaundice rapidly disappeared, complete recovery ensuing.

**Malignant Disease** is a common cause.

There is an excellent example (I,307A) in St. Thomas's Hospital Museum, where the ducts throughout the liver are dilated and filled with pus, the infective cholangitis being dependent on malignant disease of the papilla of the common bile-duct (Fig. 27).

Case 12 is that of a man, aged forty-two, who suffered from deep jaundice, with intermittent fever and ague-like attacks. Cholecystotomy gave relief, but the patient died a few weeks after, when a growth of a malignant character was found in the common bile-duct, and the ducts throughout the liver were inflamed and filled with pus.

PLATE VIII.



FIG. 28.—INFLAMMATION OF GALL-BLADDER AND BILE-DUCTS IN TYPHOID.

Death in seventh week. (No. 1,395, Guy's Museum.)



**Typhoid Fever** furnishes the museums with several specimens of infective and suppurative cholangitis.

No. 1,395, Guy's, is a specimen from a patient of Dr. Hale White's, which shows inflammation of the bile passages and cholecystitis without any obstruction in the ducts. Death occurred in the seventh week (Fig. 28).

No. 1,594A in the Middlesex Museum shows inflammation and ulceration of the bile passages in typhoid fever.

**Influenza** is not generally recognised as a cause; but cases have occurred in which the symptoms have been quite characteristic, and have come on within a few weeks after an attack. I have myself obtained a history of influenza as the apparent cause of infective cholangitis on several occasions.

The causes mentioned may truly be termed predisposing, since the true exciting cause is the presence of pyogenic organisms.

The *B. coli communis* produces an exudative inflammation of the ducts, and may actually cause abscesses within the walls of the biliary passages.

Hepatitis and liver abscess frequently follow on cholangitis, and this is usually followed by general and fatal infection of the system.

Endocarditis is at times set up, and as it has been known\* to follow cholangitis without hepatitis, and cholangitis without abscess, this possible cause should never be lost sight of in any case of ulcerative endocarditis.

The bacillus in these cases in the vegetations on the inflamed endocardium has been found to be identical with the one found in the bile.

Jaccoud and Aubert† also found endocarditis present in cases of cholangitis.

**Symptoms.**—In suppurative cholangitis there is progressive enlargement of the whole liver, which may descend as low as the umbilicus, the swelling being uniform, smooth, and tender to pressure; but the enlargement may be masked by cirrhosis, as in a case‡ reported by Drs. Jones and Clinch.

\* Netter and Martha, *Archives de Physiologie*, vol. ix., 1886.

† Clin. Med. de Lariboisière.

‡ *Edinburgh Med. Journ.*, April, 1899.

If the cause be in the common duct, and the gall-bladder has not previously become contracted, there will be the additional enlargement caused by its distension; but when contraction has taken place, and also when the obstruction is in the hepatic duct, there will be an absence of the signs of empyema of the gall-bladder.

Pain may be entirely absent where the disease is associated with cancer of the common duct; but where it is dependent on gall-stones, the pain may be severe and paroxysmal, each attack being accompanied by ague-like seizures and an intensification of the jaundice.

Jaundice is always present, and is usually both persistent and intense, though where the obstruction is a floating gall-stone acting like a ball-valve in the common duct, the jaundice may vary from time to time, and may almost disappear between the attacks of pain. Fever, with occasional rigors and profuse perspiration, forms a feature of the disease, and with this there is rapid loss of flesh and strength.

Pneumonia and pleurisy, ending in empyema, are serious and not infrequent complications of suppurative cholangitis. The disease is an extremely serious one, and usually proves fatal, though, if the cause can be removed at an early stage, recovery may occur.

If the course be less acute, the inflammation may concentrate itself in some part of the liver, leading to abscess, which may form a distinct tender swelling, and give rise to the usual symptoms and signs of hepatic abscess.

*Treatment.*—Unless free evacuation and drainage of the infected contents of the bile passages can be accomplished, either naturally or artificially, treatment is practically useless. Therefore, if practicable, cholecystotomy should be performed, and free drainage established and continued until the bile is sterile, or nearly so.

Although good results cannot be expected in all cases, an amelioration of the symptoms may be looked for in a fair proportion, and complete relief in others.

If a localized abscess be discovered in the liver, it should be opened and drained, and though it is scarcely to be expected that operation can be always successful in these more



serious cases, the chance of permanent benefit is worth snatching at, even in the most desperate conditions.

Of general means, warm applications to the hepatic regions, an initial mercury purge followed by milder laxatives, the employment of intestinal antiseptics, such as bismuth and salol, the relief of pain by sedatives (if called for), and the treatment of symptoms as they arise, will afford some amelioration, though they will probably only give temporary relief.

Surgeons have been performing cholecystotomy for infective and suppurative cholecystitis and for gall-stones producing these diseases for some years, Cases 3, 6, and 12, operated on by me in 1888, being among the earliest examples of this operation.

Cholecystotomy and drainage of the bile-ducts is the operation called for, and at the same time the obstruction, if one be present, should if possible be removed; though in some cases, where the patient is extremely ill, the latter part of the operation may be deferred until the drainage has cleared away all the infective material.

Thanks to the opening in the gall-bladder, a certain number of important therapeutic results follow:

*First.* The septic contents of the gall-bladder are evacuated.

*Second.* Calculi, which are most frequently present there, are removed.

*Third.* The other biliary passages, more or less obstructed either by calculi or by swelling of their walls, are rendered as free as possible.

*Fourth.* The septic bile is allowed to escape, and mechanically washes out the lower passages, carrying away through the drainage-tube many of the infective elements.

*Fifth.* The relief of pressure prevents absorption of the septic matter.

*Sixth.* The relief to the kidneys, by allowing the bile to escape freely, is also of importance, as they are thus enabled to perform their function more freely in relieving the system of septic and other materials.

*Seventh.* The swelling of the head of the pancreas, 'chronic pancreatitis,' so often present where the common

bile-duct is obstructed, subsides owing to the indirect drainage of the pancreatic ducts.

M. Terrier (*Revue de Chirurgie*, 1895, p. 966) relates several cases with the utmost detail, especially interesting on account of the bacteriological examination of the discharge from the fistula at different dates, conclusively showing the gradual diminution in the virulency of the bile after the drainage has been proceeding for some days, and pointing to the need of rather more prolonged drainage than some of us have been wont to employ—*i.e.*, until a bacteriological examination of the discharge shows it to be sterile, or nearly so.

**Tubercular Cholangitis** seems to occur as a rare condition, and apparently only as a sequel to tubercular infection of the intestine. Tubercles seem to form in the portal canals, and by extension to involve the bile-ducts and give rise to well-marked cholangitis. It is possible that in some cases of extensive tuberculosis of the intestine the infection may be direct, but the cases have mostly occurred in patients the subject of general tuberculosis, and in all probability the bacilli are carried by the blood-stream. As the lymphatic stream in the liver is toward the hilum, it is not likely that infection is brought in that way. This form of cholangitis is practically of little importance, as it forms merely a complication in what is necessarily a fatal condition.

## ULCERATION OF THE GALL-BLADDER AND BILE-DUCTS.

Ulcers of the gall-bladder or bile-ducts vary greatly in number, size, and depth, as also in clinical importance.

They may be quite superficial, being mere abrasions of the epithelial lining of the mucous membrane, then being as a rule numerous and widespread, or they may be single and deep, extending into or through the muscular and serous coats. Between these extremes every variety may be found, as the specimens in the museums show very distinctly.

Although cholelithiasis is the most frequent, typhoid fever and cancer are quite common causes, and cholera is also said to produce ulcers.

The slighter cases of erosion are seldom seen, though

PLATE IX.

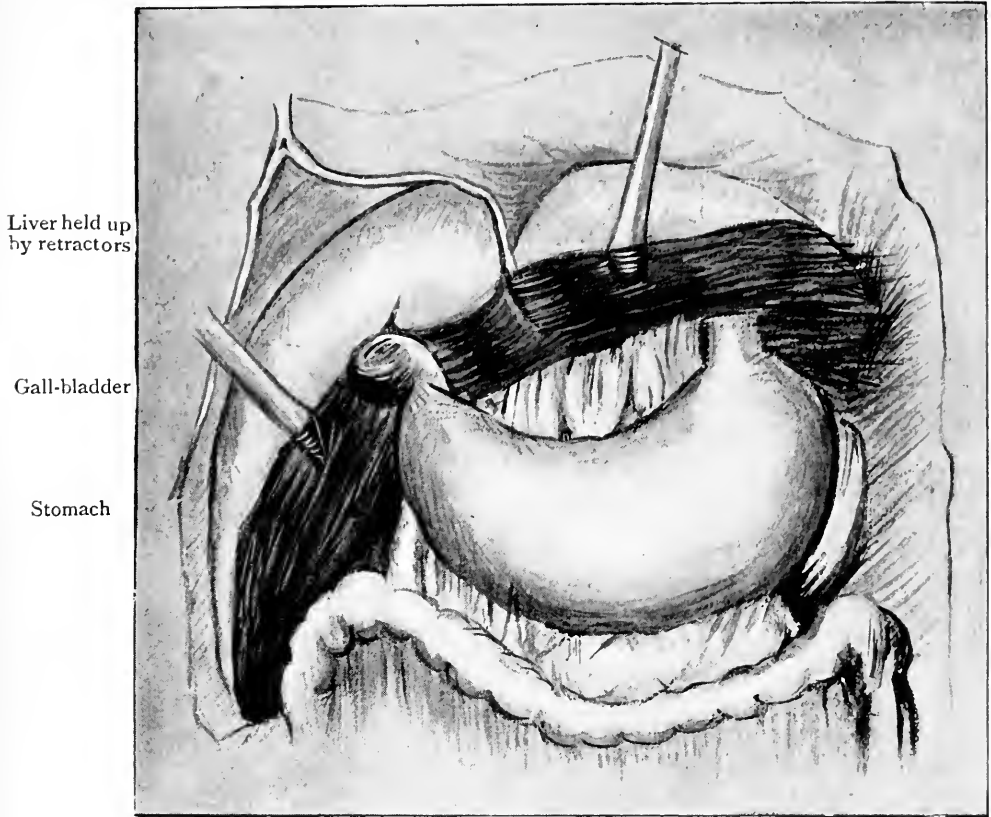


FIG. 29 —ADHESION OF GALL-BLADDER TO STOMACH, LEADING TO DILATATION OF STOMACH AND SPASMODIC PAIN.



doubtless they frequently exist in cases operated on for gall-stones, and in others where the concretions are passed naturally; but the severer forms of ulceration are more frequently met with as the immediate cause of death.

Ulceration is chiefly of importance on account of the serious sequelæ—stricture, perforation, fistula, peritonitis (local or general), hæmorrhage, septicæmia and pyæmia.

The inflammation accompanying ulceration usually extends to the peritoneal coat at the site of the ulcer, and leads to a plastic peritonitis, which causes the adjoining organs to adhere to the inflamed surface, thus in the greater number of cases keeping the peritonitis local.

**Adhesions.**—Some years ago\* we pointed out that in nearly every case of gall-stones there are adhesions of the gall-bladder or ducts to neighbouring organs, showing that peritonitis is a frequent or nearly constant accompaniment of cholelithiasis. It is doubtless a salutary phenomenon, as otherwise general peritonitis would be much more common, especially in the many cases where the adhesions permit of fistulæ quietly forming between the contiguous viscera, and where localized abscesses form without general peritonitis.

The adhesions may, either by the anchoring of normally mobile organs or by subsequent contraction, themselves become sources of inconvenience or danger, as in the case of a lady of thirty-four (Case 97), who, besides suffering from severe spasmodic pain due to chronic catarrhal cholecystitis, had dilatation of the stomach owing to kinking of the pylorus, caused by adhesions passing between it and the gall-bladder. (See Fig 29.) After separation of the adhesions and drainage of the gall-bladder, complete recovery ensued.

Mr. Page, of Newcastle, recently described a similar case† in which an acute kink of the pylorus led to dilatation of the stomach, with vomiting and death. The gall-bladder, containing gall-stones, was adherent to the pylorus, and communicated with it through an ulcerated opening.

Case 219 is a good example of ulceration of the gall-bladder followed by adhesion to the stomach, and ending in

\* Clin. Soc. *Transactions*, 1888.

† *British Medical Journal*, January 23, 1897.

a fistula between the gall-bladder and stomach. Persistent vomiting of bile, with repeated attacks of pain and great loss of flesh, resulted. At the operation, the gall-bladder was detached from the stomach, and the opening into the stomach sutured. A number of gall-stones were removed from the gall-bladder through the fistulous opening, which was brought to the surface, and used for the purpose of draining the bladder and ducts. The patient made a good recovery, and is now well.

In other cases (Nos. 54, 63, 87, and 130) the fibrous transformation of the lymph led to contraction with stricture of the pylorus, which was relieved by separating the adhesions; but in another case (No. 131) the strictured pylorus was so narrow that pyloroplasty had to be performed, which effected a complete cure.

In another instance (No. 160), the adhesions between the gall-bladder and colon led to partial obstruction of the bowels, with frequent recurrences of colic, all relieved by separating the fibrous bands.

Case 199 is a good example of typhoidal cholecystitis being followed by adhesion of the gall-bladder to the hepatic flexure of the colon. The adhesions ultimately formed strong bands encircling the colon and causing obstruction, which was cured by their division.

On looking through the list of cases, it will be found that in many instances adhesions were found to account for the symptoms, and that their separation usually afforded relief or cured the patients.

**Peritonitis**, though usually local in cases of cholelithiasis, may become general, either from perforation, as in cases to be related under that heading, or by extension to the peritoneum, through the non-perforated walls, as in cases related under the description of phlegmonous or gangrenous cholecystitis.

Under such circumstances prompt surgical treatment will be required, or death will speedily follow.

It is important to note that in perforative peritonitis from diseases of the gall-bladder or bile-ducts the effusion is at first limited to the larger pouch on the right side of the

abdomen; these cases are therefore very amenable to treatment if operated on within a short time of the catastrophe, whereas in case of delay the fluid, which is infective, tends to pass into the pelvis and to produce general infection of the peritoneum.

**Hæmorrhage.**—As the ulcer extends, the vessels usually become thrombosed, but occasionally severe hæmorrhage results, leading either to hæmatemesis or melæna.

The notes of the following fatal case were given me by Dr. Peter McGregor of Huddersfield.

A temperate man of forty-eight had suffered from gall-stone attacks since the age of twenty-six, but for a year had had no seizure, and had gained 2 stones in weight.

Without pain or other localizing sign, he began to vomit blood, and continued to do so two or three times a day until his death, which resulted from exhaustion in the third week.

An autopsy revealed contraction of the liver, with numerous gall-stones in the gall-bladder. One, the size of a large filbert, had ulcerated through the walls of the gall-bladder, and was projecting into the peritoneal cavity. There was no peritonitis, and death was due to hæmorrhage from the margin of the ulcerated opening.

Specimen No. 1,389, Guy's Museum, shows the gall-bladder and bile-ducts of a woman of fifty-four, who, after being jaundiced for two months, suddenly became collapsed, with a rapidly-increasing swelling of the gall-bladder. This was opened by Mr. Lane on the fifth day, and was found to be filled with blood-clot. She died a few hours after, when the bleeding was found to have proceeded from a laceration in a softened and ulcerated gall-bladder.\*

It is to be borne in mind that hæmorrhage is predisposed to in these cases by the aplastic condition of blood occurring in long-standing jaundice.

As ulceration is always associated with the presence of pyogenic organisms, septic absorption usually occurs, leading to constitutional disturbances in the shape of septicæmia and pyæmia, as described under infective cholangitis.

\* Clin. Soc. *Transactions*, 1895, p. 160.

**Cancer.**—Although cancer may lead to ulceration, it seems probable that long-standing ulceration of the gall-bladder or bile-ducts may predispose to malignant disease, as they are so frequently associated. This subject is more fully discussed under the heading of Tumours.

A specimen illustrative of ulceration (No. 2,263, St. Bartholomew's Museum) shows a circular ulcer in the gall-bladder, dependent on gall-stones.

No. 2,263A, St. Bartholomew's Museum, shows many small ulcers, with a larger one that has perforated and caused death from peritonitis. The walls of the gall-bladder are greatly thickened, and there is a cholesterine coating, but there are no gall-stones. The patient was a man of sixty-seven.

No. 1,675, King's College Museum, shows numerous ulcers due to gall-stones.

No. 1,594A, Middlesex Museum, affords a beautiful example of deep ulcers due to typhoid fever (Fig. 30).

No. 1,021, St. Mary's Museum, shows an epithelioma of the gall-bladder, with a perforating ulcer, occurring in an old lady, and leading to death from peritonitis (Fig. 31); and No. 2,809A, from the Hunterian Museum, shows the ulceration of a malignant stricture, causing a fistula between the gall-bladder and colon (Fig. 32).

### **STRICTURE OF THE GALL-BLADDER AND BILE-DUCTS.**

Stricture of the bile-ducts is, I should judge by my experience on the operating-table, very common, especially stricture of the cystic duct; yet if we might judge by museum specimens alone, it would seem to be one of the rarer sequelæ of ulceration, by which it is probably always preceded, except in those cases dependent on malignant disease, which are considered under another heading.

Though there is no reason why stricture should not be a sequence of typhoid ulceration, such has yet to be proved, and the only cases concerning which we can glean information have followed on cholelithiasis, or new growth.

Stricture may only render itself evident after the original



PLATE X.



FIG. 30.—TYPHOID ULCERATION OF GALL-BLADDER.  
(No. 1,594A, Middlesex Museum.)

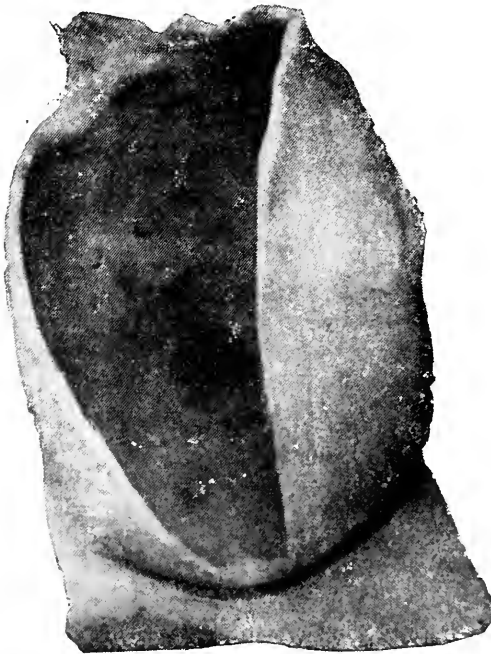
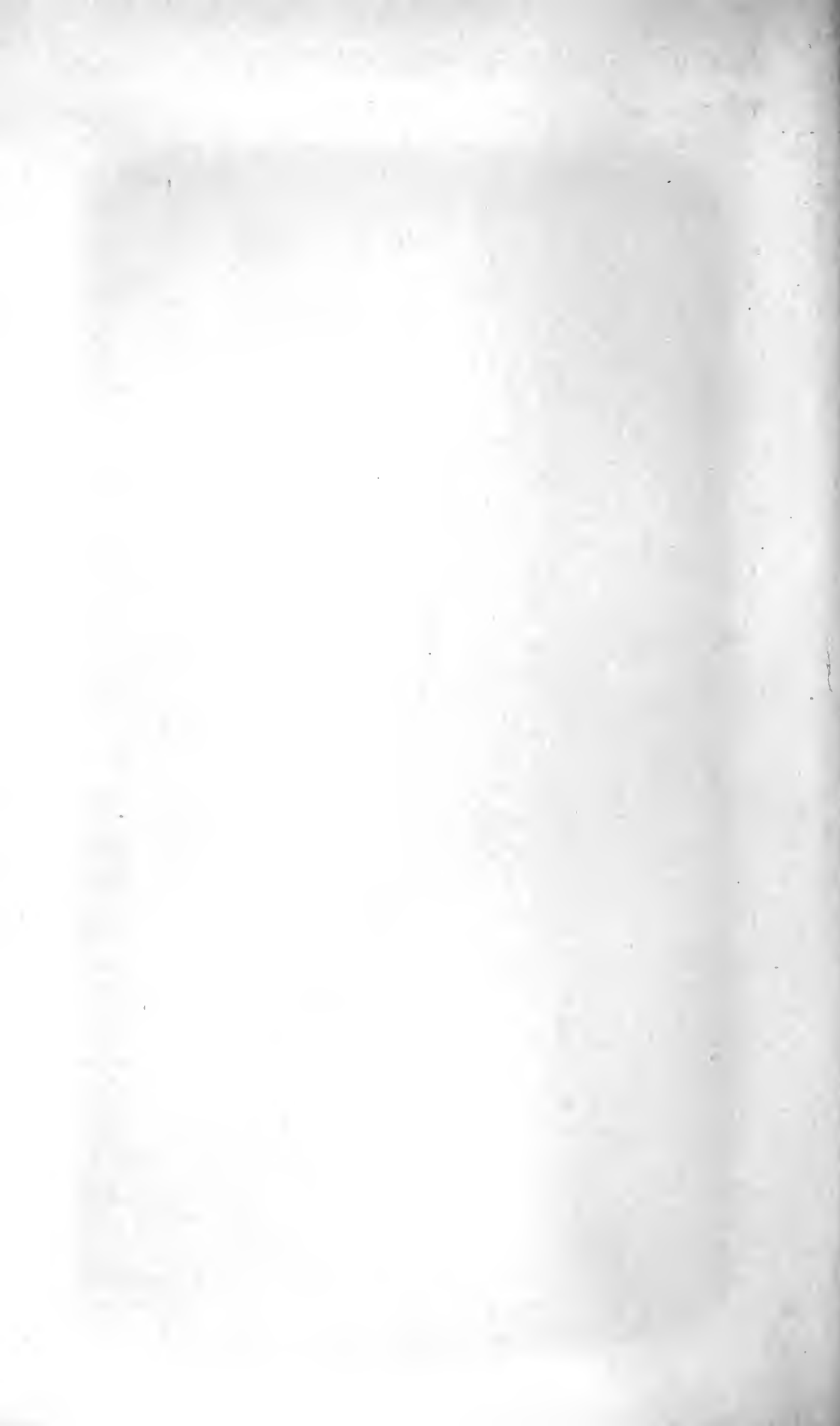


FIG. 31.—PERFORATING EPITHELIOMATOUS ULCER OF GALL-BLADDER.  
(No. 1,021, St. Mary's Museum.)



cause has passed away, as in several cases of stricture of the cystic and of the common duct on which I have operated, where the cause in the shape of gall-stones was removed, and the strictures which developed had subsequently to be treated; and in another case of stricture of the common duct, where the history of gall-stones was indubitable, though none were found when the abdomen was explored. (Cases 13, 22, 195, etc.)

Notwithstanding the probable frequency of its occurrence, a search through the museums revealed only a single specimen illustrating simple stricture of the bile-ducts: that is in the Hunterian Museum (No. 2,804), and shows a long stricture of the common duct; but there are many specimens showing stricture the result of new growth, and some representing obliteration of the whole duct (Fig. 33).

If the stricture be in the hepatic duct, it will lead to jaundice without distension of the gall-bladder; if in the cystic duct, to distension of the gall-bladder without jaundice; but if in the common duct, both to jaundice and distended gall-bladder, unless the latter be contracted as the result of previous gall-stone trouble.

Armeus (*Thèse de Paris*, 1896) has shown that it is possible for the contents of the gall-bladder to remain aseptic in cases of obliteration of the cystic duct, and that in this condition atrophy of the organ results.

In the majority of the cases, however, where the stricture of the cystic duct is due to ulceration following the impaction of gall-stones, extensive changes will have already taken place in the gall-bladder. It may be contracted, the walls being composed merely of cicatricial tissue. In such a case the contracted gall-bladder remains quiescent.

Where extensive changes have not already taken place in the wall of the gall-bladder, and where the mucous membrane is still active, distension of the organ with mucus or muco-pus will occur. If relief is not afforded by operative measures, of which cholecystectomy is chiefly indicated, suppurative or phlegmonous cholecystitis may occur, or the distended organ may rupture into the peritoneum, or discharge its contents by the formation of a fistula between

the gall-bladder and duodenum, stomach or colon; or the gall-bladder may gradually dilate so as to form a tumour resembling an ovarian cyst.

The following case, among other complications, had stricture of the cystic duct, necessitating cholecystectomy :

CASE 483.—Mr. I., aged fifty, seen with Dr. Brown, of Taunton, gave the history that he had been subject to painful attacks, called indigestion, from the age of fourteen to sixteen, but that he had been free from the seizures until sixteen years ago, when acute pain was felt, followed by jaundice associated with fever and rigors. Since that time he had had similar attacks at varying intervals, but lately there had been five or six severe seizures in rapid succession, accompanied by rigors, continued fever, and increase of jaundice. When seen by me the liver was  $1\frac{1}{2}$  inches below the costal margin, but no tenderness could be detected anywhere. A slight icteric tinge was present in the conjunctivæ. The attacks appeared to have been brought on by gastro-duodenal catarrh extending to the common bile-duct and to the pancreas. A diagnosis of gall-stones in the common duct was made and an operation advised.

*Operation, January 29, 1903.*—The gall-bladder was firmly adherent to the surrounding structures, and was separated with difficulty. A fistula between the gall-bladder and the duodenum was thus exposed, and after separating the gall-bladder, the opening in the duodenum was closed by a purse-string suture. Two stones were felt in the common duct, and there was also some swelling of the head of the pancreas. The stones in the duct were crushed, and then extracted by the scoop after incising the duct. No more stones could be detected in the ducts, and a probe readily passed down into the duodenum. The gall-bladder was small and contracted, and the cystic duct was strictured at the junction with the common duct.

Cholecystectomy was performed, and the hepatic duct was drained by a tube passed through the incision in the duct, which was closed around it by a catgut suture. A gauze drain was passed down by the side of the tube and the wound closed.

The patient made a good recovery, and is now well.

The following case is a good example of stricture in the common duct following the passage of gall-stones some years previously :

CASE 436.—Mrs. T., aged fifty, seen with Dr. Lawrence, of Darlington, April 26, 1902. During many years had frequent attacks of biliary colic, but she had been quite free from them for five years. Twelve months ago began to have shivering attacks with epigastric pain, followed by jaundice; lately had rigors three or four times a week. Three months ago cholecystotomy was performed in Newcastle, but no stones discovered.

When seen by me there was a biliary fistula acting incompletely, and the patient was suffering from infective cholangitis, with rigors, fever, and slight jaundice.

*Operation, May 6, 1902.*—The pancreas was found enlarged (chronic pancreatitis), and a gall-stone was removed from the common duct by choledochotomy; but, as a probe would not pass into the duodenum, the bowel was opened and the papilla found strictured. The papilla was laid open, and the duct stretched by means of forceps.

Recovery from operation was uninterrupted, but the fistula never completely closed, so that in all probability the stricture of the common duct recurred. Cholecystenterostomy could not be performed on account of the contracted state of the gall-bladder.

*Symptoms.*—If in the cystic duct, stricture leads to a gradual enlargement of the gall-bladder, which may be quite painless, as in Case 1; almost painless, as in Case 2; or which may give rise to considerable distress, as in Case 10.

If in the common duct, jaundice supervenes, at first being only slight, but ultimately becoming severe, and being associated with all the usual distressing and dangerous symptoms of chronic icterus, as shown in Cases 3 and 143. The liver enlarges, and may descend to the level of the umbilicus; the gall-bladder may also enlarge, though, if gall-stones have been the cause, the gall-bladder may have become contracted and so be incapable of distension.

Stricture of the hepatic duct is probably extremely rare,

for we can only find an account of one case, and that by Dr. Wyeth, who related the history, and showed the specimen from a case of recurrent gall-stone obstruction, in which the gall-bladder was found collapsed and empty at operation, and the patient died unrelieved.

A post-mortem examination revealed a small concretion in the peritoneal cavity, and a stricture of the hepatic duct where the gall-stone had ulcerated its way through.

A form of stricture, not common, may be found in the gall-bladder, converting that ordinarily pear-shaped cavity into the form of an hour-glass.

Among the cases abstracted below were two in which this condition was present. In one, the upper cavity was separated from the lower by an apparently impermeable stricture, though both cavities contained gall-stones. The upper sac was amputated and the lower drained, after the concretions had been removed.

A specimen in the Middlesex Museum shows the condition very well.

Needless to say, stricture of the bile passages will scarcely call for diagnosis apart from its cause, though different treatment will be demanded when the disease is recognised at the time of operation. In stricture of the cystic duct the gall-bladder should be removed, as in Cases 2, 22, 65, and 257, etc.; otherwise a recurrence of the symptoms will occur when the wound closes, or there will be a permanent mucous fistula, as in Case 1.

The following are examples of cholecystectomy:

**CASE 495.—Cholecystitis—Residual Abscess—Chronic Pancreatitis—Cholecystectomy—Recovery.**—Mr. O., aged fifty-nine, seen with Dr. Le Rosignol, Jersey. A year ago had an attack of biliary colic, followed by numerous other attacks, the last two having been accompanied by jaundice. The liver was somewhat enlarged, and there was tenderness to the right of and above the umbilicus. No enlargement of the gall-bladder.

*Operation, March 26, 1903.*—Extensive adhesions; swelling of head of pancreas; remnant of abscess between the gall-bladder and duodenum found, but no gall-stones; gall-

bladder thickened and contracted; cystic duct strictured close to gall-bladder; cholecystectomy; drainage of lower part of cystic duct.

*After History.*—Patient made a good recovery, and was able to return home in the fifth week.

**CASE 434.—Gall-stones—Cholecystitis—Structure of Cystic Duct—Cholecystotomy.**—Mrs. J., aged forty-one, seen with Dr. Riley, of Sale. For five years had suffered from attacks of biliary colic without jaundice. Three weeks before operation had a very severe attack, with enlargement of the gall-bladder and local peritonitis.

*Operation, April 18, 1902.*—The gall-bladder was dilated with pus, and was thickened and inflamed. The pus was removed by aspiration, several stones were extracted from the gall-bladder, and another stone discovered impacted in the cystic duct. This, which could not be pushed upwards into the gall-bladder, was removed by incising the duct. The cystic duct was ulcerated and stenosed. Cholecystectomy was performed. As it was thought that a stone had been felt in the common duct, an incision was made into the duct for exploration, but with a negative result. The patient made a complete recovery, and is now well.

As an alternative, the gall-bladder may be short-circuited into the intestine, as in the case reported by Mr. Paul in the *Lancet* for March 24, 1895; but, seeing that the opening in a cholecystenterostomy tends to close, the operation of cholecystectomy is preferable.

In stricture of the common duct, cholecystenterostomy must be performed, as in Case 13, reported below, otherwise a permanent biliary fistula will certainly follow. At times, however, this may be impracticable, and in such cases drainage alone may be feasible.

**CASE 13.—Cholecystotomy—Biliary Fistula apparently due to Stricture of the Common Duct—Cholecystenterostomy—Recovery.**—On January 9, 1888, a married woman, aged forty-two, was admitted to the Leeds General Infirmary, suffering from acute local peritonitis, with a tumour in the region of the gall-bladder.

On January 14 laparotomy was performed through the

upper part of the right linea semilunaris, and 8 ounces of fetid pus removed from the gall-bladder. Exploration of the ducts by the finger and a probe failed to discover any gall-stones. The gall-bladder was stitched to the abdominal wound and drained, and the patient made a good recovery, but with a biliary fistula. Although she had retained good health during the fifteen months when the fistula was open and discharging the whole of the bile, her condition was a very miserable one, since no apparatus could be made to catch the overflowing fluid when she was walking about, and her dressings and clothes became saturated.

Cholecystenterostomy was performed on March 2, 1889, by re-opening the abdomen through the old cicatrix in the right semilunaris. The viscera in the neighbourhood were found to be so matted together that it seemed to be impossible to fix the gall-bladder to the duodenum, and as the hepatic flexure of the colon was conveniently near, the gall-bladder was fixed to it by a double row of sutures round a decalcified bone bobbin, a free communication being made between the two viscera. After a tardy convalescence, she completely recovered, and was well in every respect ten years later.

### **PERFORATION OF THE GALL-BLADDER AND BILE-DUCTS.**

Perforation of the gall-bladder or bile-ducts must always be serious on account of an escape of the visceral contents into the peritoneal cavity; the imminence of the danger, however, depending on two factors: first, the nature of the extravasated fluid; and, secondly, the time allowed to elapse before surgical relief is afforded.

The presence of healthy bile in the peritoneum, due to an injury such as a stab, a bullet wound, or a blow, in a healthy individual, may be tolerated for some time without serious damage, as in a case recorded by Thiersch, who successfully removed over 40 pints of bile-stained fluid from the abdominal cavity after the gall-bladder had been ruptured by a blow.

The experiments of Schuppel and Bostrom apparently prove that the peritoneum can absorb bile without serious trouble, and there have been several cases reported in which



extravasated bile has been successfully evacuated, either by tapping or by incision and drainage.

In the chapter on injuries of the bile passages it is shown that healthy bile does not as a rule give rise to peritonitis, and that in many cases extravasations of bile into the peritoneum after injuries to the bile passages have been absorbed. Such a fortunate result cannot, however, always be looked for, as is shown by the specimens in some of the museums.

It is of far more serious moment when the extravasated bile is pathological, as it for the most part is where there is distension of the gall-bladder or any disease of the bile-ducts; for in such cases the bile is infective, and rapidly sets up a diffuse peritonitis, which, unless speedily operated on, ends fatally.

Even in such cases, if the diagnosis be made at once and early operation done, the prognosis is good, as in the case of a commercial traveller, aged forty-five, who had suffered from gall-stone seizures for twenty-nine years, and whom I saw with Dr. Braithwaite, of Leeds (No. 81).

After symptoms of inflammation in the hepatic region extending over several weeks, he suddenly became worse and showed signs of general peritonitis. The abdomen was opened in the right linea semilunaris, and several pints of bile and pus were evacuated. The peritoneal cavity was washed out, and drainage-tubes placed between the liver and diaphragm, into the right kidney pouch, and downwards towards the pelvis, with the result that the patient recovered, and is now in perfect health.

I have also had another case in which a gall-stone ulcerated through the gall-bladder and extravasation of bile occurred where operation was followed by recovery.

CASE 412.—Mrs. M. T., aged forty-seven, admitted to the Leeds General Infirmary, January 21, 1902. Had had spasms for years, but no definite attack of biliary colic. On January 17 the patient was seized with acute pain in the abdomen, accompanied by vomiting, shivering attacks, and jaundice. The pain had been extremely severe, accompanied by evening rises of temperature. On admission, she was deeply jaundiced. The gall-bladder was enlarged and extremely tender, and the abdominal walls rigid.

*Operation, January 23, 1902.*—On opening the peritoneum a quantity of bile escaped, and a cavity was exposed bounded above by the liver and gall-bladder and below by omentum and adhesions. The cavity contained a quantity of bile and some gall-stones. The fundus of the gall-bladder was gangrenous and perforated. Several stones were removed from the gall-bladder and cholecystectomy was performed, a tube being passed into the cystic duct, through which bile drained quite freely. The patient made a good recovery, and was discharged well, March 12, 1902.

A case of perforation of the gall-bladder following typhoid ulceration successfully treated by abdominal section is reported by Dr. Monier Williams and Mr. Marmaduke Sheild in the *Lancet* for March 2, 1895. The case occurred in a married woman, aged thirty-one, who was submitted to operation on the fifty-first day of the disease, when the gall-bladder was found to be rigid and thickened, and of a dark plum colour, with a sharply circular, sloughy ulcer, the size of a threepenny piece, near its neck, the gall-bladder containing about  $1\frac{1}{2}$  ounces of thick offensive pus. The abdomen was washed out, the distended intestines were emptied by puncture, and gauze packing with drainage adopted, the result being a complete cure.

In rupture of the gall-bladder from sudden pressure, induced by straining at stool, vomiting, sneezing, efforts in parturition, or even by blows over the hepatic region, there is in all probability in the greater number of such cases a predisposition to rupture, in the shape of thinning by ulceration or by long-continued distension, otherwise the accident would be much more common.

This was probably so in the case reported\* by Dr. Willard, and in the one described by Mr. Lane in the *Lancet* for March, 1894, and certainly was in the following case, which occurred in a middle-aged woman, and was reported by Dr. G. P. Biggs in the *New York Hospital Reports*.

The onset of the fatal seizure was sudden, and accompanied by colicky pains in the upper abdomen, rapidly followed by signs of acute general peritonitis. She died on the fourth day of her illness.

\* *Transactions, American Medical Association, 1893.*

At the autopsy the abdomen was found to be greatly distended, and full of a dark brown, bile-stained fluid, having a slightly fæcal odour, the peritoneum being covered with fibrinous exudation.

Just inside the orifice of the common bile-duct a large gall-stone was impacted, and at the junction of the gall-bladder and cystic duct, a minute oblique perforation was found in the floor of an old ulcer. The cystic, hepatic, and common ducts were all much dilated, the last admitting a cylinder 1 centimetre in diameter.

The muscular wall of the gall-bladder was hypertrophied, and the mucous membrane thickened from chronic inflammation, while near the outlet there was a superficial ulceration.

Predisposition was also present in a case I saw with Dr. Solly, of Harrogate, of an aged physician, who had been aware of a tumour in the gall-bladder for many years, and which occasionally gave him severe pain, though usually it produced no inconvenience. In his final seizure he developed acute peritonitis and rapidly succumbed.

Dr. Solly discovered a perforation in an old ulcer in the gall-bladder, which must have been present for a long time. Numerous gall-stones were also found in the gall-bladder and cystic duct.

In Case 241, on opening the abdomen, there was found a gall-stone actually partly extruded into the peritoneal cavity, there being no adhesions between the gall-bladder and its surroundings which would in any way have limited the effusion, so that had operation been delayed general peritonitis must have speedily ensued.

Such cases show conclusively that it is folly to permit patients with distended gall-bladders, even though symptoms be only occasionally present, to go unoperated on. We know of several cases where patients are living in a fools' paradise owing to such unsound advice.

A careful operation in these cases is almost devoid of risk, but rupture is hazardous in the extreme.

Massage in cases of distended gall-bladder we look on as the height of folly, though it has been advised by those who should know better.

Attempts to force impacted calculi onward by pressure are well calculated to rupture the thinned wall of the gall-bladder or bile-ducts, or to cause perforation through the base of an ulcer, leading to extravasation of infective matter into the general peritoneal cavity, and probably to fatal peritonitis.

In the greater number of cases, perforation occurs slowly, as was the case in an aged woman seen with Dr. Chadwick a few days before her death, where jaundice had been present for five years, and at the autopsy a large gall-stone was found lying in a cavity outside of, but pressing on, the common duct. The adventitious cavity was shut off from the general cavity of the peritoneum by adhesions of the neighbouring viscera.

Specimen No. 1,596, Middlesex Museum, shows a portion of liver with the gall-bladder. In a sac beneath it are a number of calculi which have escaped through a perforation in the gall-bladder, and are lying in a cavity formed by peritoneal adhesions.

Specimen No. 2,830, Royal College of Surgeons Museum, shows a cyst between the hepatic and cystic ducts containing a calculus adherent to both, but communicating with neither duct, though it has evidently perforated one of the channels (Fig. 34).

Gall-stones may perforate the mucous membrane and become encysted in the wall of the ducts, as in a case I saw with Dr. Bramwell, of Cheltenham. After the removal of several stones from the gall-bladder, three were felt in the common duct, two of which were readily removed by cholecdochotomy, but the third was buried in the wall of the duct, and could only be extracted through a second incision (Case No. 261).

In some cases, as in one reported in the *Lancet* for 1893 by Mr. C. A. Morton, the primary perforation may lead to the formation of a second cavity bounded by plastic lymph, which may again rupture, and lead to a fatal peritonitis. The following is a brief account of the post-mortem appearances in the case referred to, the patient being a woman of sixty: 'The body was well nourished. The abdomen

PLATE XII.



FIG. 34.—ADVENTITIOUS SAC CONTAINING GALL-STONE SITUATED BETWEEN  
HEPATIC AND CYSTIC DUCTS.

(No. 2,830, Royal College of Surgeons Museum.)

*To face p. 122.]*



was distended, and on opening it much orange-coloured fluid escaped, and general recent adhesive peritonitis was discovered. Just below the liver was a cavity the size of an orange, bounded above by the under surface of the liver, and in front by the thin margin of the liver and the omentum, which had been adherent to it. Below, it was separated from the colon by much thickened tissue. On its inner side lay the omentum, and on its outer side, covered by adhesions between the liver and adjacent parts, lay the gall-bladder, which opened into the cavity by an aperture which would admit one or two fingers. The wall of the gall-bladder was much thickened, and several stones  $\frac{1}{2}$  inch in diameter were found lying in it. Where the omentum had before been adherent to the anterior edge of the liver, forming the anterior wall of the cavity, it had become detached, and thus the bile had escaped into the peritoneum, and set up fatal peritonitis. No doubt at one time the gall-bladder containing gall-stones had perforated under these surrounding adhesions, and thus the secondary gall-bladder had been formed, which in its turn had finally ruptured into the peritoneum. The gall-bladder was not dilated.'

Erdman (*Annals of Surgery*, June, 1903) publishes the following case of perforation of the gall-bladder :

Female, aged forty-six years ; married, mother of several children ; passed through a typical prodrome, which was followed by a five weeks' course of unquestionable typhoid fever. The eruption, although scanty, was evident and unmistakable. Headaches, enlargement of the spleen, character of stools, abdominal distension, dry, coated and fissured tongue, delirium, followed by manifestations of exhaustion, subsultus tendinum, and carphologia, presented a clinical picture that, even without the typical temperature, as shown by the chart, could be taken but for the one thing, typhoid fever. During the period of her third and fourth weeks a left-sided phlebitis developed. Two attacks of pain in the back, described as being between the shoulder-blades, were present in the third week, but at no time, according to the chart, were there any other symptoms present suspicious enough to call any attention or notice to the gall-bladder.

Her temperature reached a normal plane at the close of the fifth week. On October 21, the day before I saw her and about the second day of her sixth week, convalescence was sufficiently advanced to allow her to sit up in bed. On the night of this day, at ten o'clock, she was seized with a severe pain in the abdomen, which required several hypodermics of one-fourth grain of morphine before any comfort was obtained. The site of this pain was not specialized as to its onset location when I saw her. She suffered considerable shock, and when seen by me, exactly twelve hours after the onset of pain, presented, in addition to those accompanying a protracted illness, the following symptoms: anxious countenance, pulse 120, respiration rapid, temperature 102° F., abdomen somewhat distended, exquisitely sensitive all over, but more marked on the right side.

Although rather later than usual for a perforation of the intestine, it was concluded best to explore the right iliac fossa. This was done by an incision through to right rectus. Upon incising the peritoneum there was a gush of bile-stained, cloudy fluid, with no odour and no food particles, through the opening in the abdominal wall. Our tentative diagnosis of perforation of the intestine was then changed to that of a probable perforation of the duodenum or gall-bladder; at the same time all the small intestines were carefully gone over before extending the incision. Fully a pint of bile-stained fluid was sponged out during the process of inspection of the intestines and the enlarging of the incision. The gall-bladder and duodenum were easily exposed, and then it was seen that an opening, irregularly circular, fully  $\frac{1}{4}$  inch in diameter, was present in the lower portion and inner aspect of the gall-bladder near the cystic duct, through which clear bile was flowing. The gall-bladder on its outer aspect presented no other inflammatory manifestations, nor was it evident that it had been enlarged previous to the perforation. The mesentery and intestines were deeply stained with bile and were very friable, the peritoneum tearing upon the gentlest handling.

I decided to do a cholecystectomy. This was very easily accomplished, the hepatic attachment being separated, owing



to the very friable condition, with the greatest ease. A double catgut ligature was passed about the cystic duct, the bladder excised, and the mucous membrane presenting in the stump brushed with pure carbolic acid; a gauze drain leading down to the stump, and also a gauze packing on the very freely bleeding hepatic surface from which the gall-bladder had been removed, was employed. The peritoneal cavity was sponged out with salt solution and gauze pads. The abdominal wall was then closed, except at the point of exit of the drain and at its lower angle, where another gauze drain passed into the iliac fossa and pelvis. This latter drain was removed in three days. The drain and packing in the region of the stump were removed at this time, but another small drain was placed in this opening. A perfect recovery and complete union were recorded in three weeks. Upon closer investigation after the operation had been done, we were told that her onset of pain was situated at or about the usual surgical location for gall-stone colic, and that the general abdominal pain appeared at or about the end of the sixth hour.

Upon opening the gall-bladder, two small stones, so small as not to be considered factors in the cause of the ulceration, were found. The mucous membrane presented numerous small ulceration areas, and no opening was found to correspond to the opening seen on the peritoneal surface. There was a small ulceration area, about the size of the head of an ordinary pin, in the mucous membrane at a point almost directly through from that of the peritoneal opening, and, upon passing a probe into this opening, it was found to pass obliquely through the gall-bladder, making its exit through the peritoneal orifice, giving one the reverse picture of the funnel-shaped perforating ulcer usually seen.

Cultures taken from the contents of the peritoneal cavity and from the gall-bladder showed the colon and typhoidal bacilli.

He also gives a record of thirty-four cases, with four recoveries. Of these thirty-four cases, twenty-seven were not operated upon, and all died. Of the seven cases in which an operation was performed, four recovered and three died.

Erdman strongly advocates cholecystectomy, and does not approve of cholecystotomy or of repair of the perforation by suture.

The perforation may occur into adjoining parenchymatous organs. If reference be made to the list of cases, it will be seen that on several occasions gall-stones have been removed from cavities in the liver produced by ulceration and perforation of the gall-bladder or bile-ducts, and direct passage of the contents into the liver tissue. (Cases 6, 27, and 268 are examples.)

In such cases there are the usual signs of liver abscess following on the ordinary symptoms of gall-stones, which may have been present for years.

If the ulceration and perforation occur from the common duct into the substance of the pancreas, acute pancreatitis may follow; or, without perforation, an infective inflammation may pass from the common bile-duct to the pancreas, as in a case reported\* by Dr. Kennan, in which a woman of thirty-eight died of collapse after two days' illness, characterized by epigastric pain, vomiting, and abdominal distension. A post-mortem examination revealed acute pancreatitis, with a large number of stones in the gall-bladder and common bile-duct, one of the concretions protruding into the duodenum.

The following case is a good example of *acute gangrenous pancreatitis* following on gall-stones, in which operation led to complete recovery of health:

**Gall-stones—Acute Pancreatitis.**—Mr. S., aged fifty-eight, seen with Dr. Nettle, of Liskeard, Cornwall, on March 31, 1902.

*Previous History.*—For some six years the patient had been subject to paroxysmal attacks of acute pain starting in the right hypochondrium and radiating over the abdomen and through to the right scapula, the attacks being accompanied by vomiting and more or less collapse. On several occasions he had passed small gall-stones.

About ten weeks ago he was seized with an attack which did not, as usual, yield to morphine; the liver became enlarged and tender, there was a great amount of flatulence

\* *British Medical Journal*, November 14, 1896.

and acidity, and a feeling of discomfort generally. After this seizure he had ague-like attacks and jaundice of varying intensity, and from that time a tumour steadily developed in the epigastric and right hypochondriac regions. He so rapidly lost flesh and strength that when he was taken into a surgical home in London for operation he was so feeble and emaciated that it was questionable whether he would be strong enough to bear it. Jaundice was well marked, and the tumour in the upper abdomen, which was tense, tender, and fluctuating, was still enlarging. He had had diarrhœa six times a day for several days before admission, and the motions were pale and contained fat. Just before operation he vomited clear fluid, not containing bile.

*Operation, April 5, 1902.*—Pancreatic cyst exposed between the stomach and colon, containing four pints of straw-coloured fluid. Inside the cyst was found a mottled black slough with gray patches,  $2\frac{1}{2}$  to 3 inches long by  $1\frac{1}{4}$  inches broad, and  $\frac{1}{2}$  inch thick, evidently pancreas.

Gall-bladder and ducts contained thirty stones, two the size of walnuts; one of these at the junction of the cystic and common duct, and pressing on the latter. Cyst of pancreas and gall-bladder drained by separate tubes, with stomach and first part of duodenum between them.

On being put back to bed the patient was quiet, but vomited frequently. He made a steady recovery, without any untoward symptoms, and left for home on May 2, 1902. On March 3, 1903, the patient was the picture of health, and had gained  $1\frac{1}{2}$  stones in weight. He told me that the gall-bladder opening had closed in six weeks and the pancreatic fistula in nine weeks. Well November, 1903.

In the following case abscess of the pancreas resulted from gall-stone irritation :

**CASE 343.—Chronic Pancreatitis with Abscess associated with Gall-stones—Cholecystotomy—Relief—Death Four Months later from Exhaustion—Autopsy.**—Mr. H., aged forty, seen with Dr. Woods, of Batley, on October 11, 1900. The patient was then deeply jaundiced and extremely ill, suffering from continuous fever with exacerbations, great debility, and extreme emaciation. A large tumour in the region of the pancreas

could then be felt, as well as a distended gall-bladder. He gave the history of failing health for nine months, and a history of gall-stone attacks and painful indigestion for some time before that; but although he had had frequent attacks of abdominal pain for three or four months, the jaundice had only supervened a fortnight before my seeing him. At the operation he was too ill to bear a prolonged search, and there were numerous adhesions around the tumour, which was made out to be a swelling of the pancreas. The gall-bladder was opened and drained of a quantity of muco-pus. A quantity of pus was discharged from the drainage-tube several days after operation, and this was repeated on two or three occasions; the pus evidently came from a deeply-seated abscess in the pancreas. A large drainage-tube having been used, there was a free discharge of bile, and a considerable number of gall-stones were evacuated through it—thirty-three in all. Previous to the operation the patient was suffering from shivering attacks and a persistently elevated temperature, which subsided immediately after drainage was effected, and the temperature kept nearly normal throughout the remainder of his illness, it being normal in the morning, though there was usually a hectic rise each evening. He made a slow though apparently steady recovery from the operation, and the pancreatic tumour diminished so rapidly that it was confidently believed to be entirely disappearing, it being only one-third as large as at the time of operation. He returned home on December 14, but he never really picked up strength, and, though there was no further elevation of temperature, he gradually got weaker and died in February from exhaustion.

At the post-mortem examination, made by Dr. Woods, a tumour of the pancreas was discovered, which was carefully examined by Mr. Cammidge and pronounced to be a chronic inflammatory tumour, and not new growth, the centre being occupied by pulpy material where the abscess had originally been. Nothing else was discovered, and there were no gall-stones left, either in the gall-bladder or ducts.

**CASE 481.—Gall-stones—Abscess of Pancreas.**—Mrs. P., aged sixty-one, seen with Dr. Pemberton, of Burnley. For thirty-

four years had had attacks of biliary colic from time to time, but had never been jaundiced after the attacks. For the last two and a half years had been subject to rigors, accompanied by slight epigastric pain.

Jaundice always present more or less during the last two and a half years, but deeper after the ague-like attacks; pain never severe. On examination, the liver was not enlarged, and there was no distension of the gall-bladder. The head of the pancreas was enlarged and tender.

*Operation, January 19, 1903.*—Hepatic and common ducts packed with large gall-stones. Head of pancreas much enlarged, containing cavity filled with pus, from which the largest gall-stone was extracted. Cholecystotomy, choledochotomy. Profuse discharge of bile and offensive pancreatic fluid with pus for a week. The patient, who was extremely ill at the time of the operation, made a good recovery, and is now completely well.

If the ulceration advance towards the adjoining hollow viscera, stomach, duodenum, or colon, adhesions as a rule form, and the perforation is effected quietly. In one case of this kind, seen with Dr. Stewart, after a history of cholelithiasis, followed by severe stomach symptoms, the gall-stones were vomited, and complete recovery followed.

In several cases we have known large gall-stones to ulcerate their way quietly, and to perforate the intestine, only producing serious symptoms from mechanical intestinal obstruction. These will be considered in detail under the heading of *Fistula and Intestinal Obstruction*.

Rarely gall-stones have perforated into the pelvis of the right kidney, producing symptoms of renal calculus.

Not infrequently the perforation may occur after adhesion to the parietal peritoneum, when a superficial abscess may follow, discharging gall-stones.

Specimens in the museums show that, although adhesions may have formed, the process of ulceration into a neighbouring cavity is by no means always free from danger of perforation into the general peritoneal sac.

Specimen No. 864 in the Charing Cross Museum shows a

gall-bladder colic fistula, in which there has been a fatal perforation into the peritoneum.

Specimens No. 1,676, King's College Museum, and No. 2,828, Royal College of Surgeons Museum, show gall-bladder duodenal fistulæ, in which death occurred from perforative peritonitis after the gall-stones had passed into the intestine.

There is also another danger, which should by no means be despised, and that is the fear of absorption of toxins, with subsequent septicæmia or pyæmia.

The symptoms of perforation of the bile passages are those of perforative peritonitis from other causes, but there will usually have been premonitory symptoms pointing to the origin of the disease.

A sudden pain beneath the right ribs and collapse, usually succeeded by vomiting, general distension of the abdomen, and a rapid pulse, form the prominent features of the disease.

If the extravasation is extensive, there will be signs of free fluid in the peritoneal cavity.

Jaundice, if not present before the accident, usually comes on from absorption of biliary pigment by the peritoneum, and if the bowels can be moved, the motions will usually be clay-coloured.

If the case be not operated on, death will probably ensue within a few days from toxæmia and paralysis of the bowels, though in some of the cases quoted, life was prolonged into the second or third week.

*Treatment.*—In these cases medical treatment is useless, and to give opium for the relief of pain so disguises the symptoms that a fatal sense of security is given for a time, and when the mistake is discovered it may be too late to operate.

As soon as it is clearly made out that perforation has occurred, or even if it be suspected that such is the case, the abdomen should be opened in the right semilunar line.

If pus and bile be found, they should be rapidly wiped away with gauze or wool sponges, and if the extravasation has gone beyond the local area of disease, the abdomen should be flushed with hot sterilized saline solution.

The patient may be too ill to bear a prolonged operation, and if so, free drainage will probably do all that is necessary.

In draining, it should be borne in mind that the right kidney pouch forms a distinct peritoneal pocket, and that a drainage-tube applied through a stab opening in the right loin affords a free exit for extravasated fluids coming from the neighbourhood of the gall-bladder. If the whole peritoneal cavity has been soiled, a puncture above the pubes large enough for a tube to be passed into the pouch of Douglas may be an advantage.

If the patient be in sufficiently good condition to permit a search for the rupture, and it can be found, it may be closed by fine silk or catgut sutures, but as a rule it will be wise to open and drain the gall-bladder at the same time.

Should marked cholecystitis be found, the question of cholecystectomy may be worth considering; but when the patient is in a critical condition it is a mistake to attempt too much, and, as a rule, cleansing and free drainage will be all that are necessary or advisable at the time, the removal of the cause being left until the patient is better able to bear a more prolonged operation.

### **FISTULA OF THE GALL-BLADDER AND BILE-DUCTS.**

Fistulæ in connection with the bile passages are by no means uncommon, and their variety is considerable. They result from operation, or from disease, and in the latter case they are due to ulceration resulting from gall-stones or cancer.

The fistulous channel may either be direct or indirect, in the former being caused by an advancing ulcer setting up local peritonitis, and causing adhesion of the gall-bladder or bile-ducts to one of the neighbouring hollow viscera, or to the parietal peritoneum. The extension of the ulcer continuing, a communication is established with the contiguous channel or with the surface. In the indirect variety the perforation occurs first into an adjoining parenchymatous

organ or into a localized abscess, and then into an adjacent hollow viscus, or on to the surface of the body at some part.

A fistula may also arise from a local abscess forming outside the biliary passages around the primary focus of inflammation, and then bursting into the adjoining cavities, which are thus made to communicate.

Although the establishment of a fistula is at times dangerous, and at others excessively annoying or uncomfortable, in many cases it forms one of Nature's methods of relief, and the surgeon, in forming a permanent biliary fistula in otherwise incurable jaundice, or in making an anastomosis between the bile passages and the intestine for the like purpose, is taking a leaf from Nature's book.

Many of the fistulæ are mere pathological curiosities, quite undiagnosable, and only capable of being discovered post-mortem. Many must form and heal, leaving the patient cured, and thus not only are they not discovered, but they are probably not even suspected; for, contrary to what one might suppose, fistulæ between the bile passages and other hollow viscera in the majority of cases heal spontaneously, leaving only visceral adhesions; so that the fistulæ are comparatively rarely found post-mortem.

It will thus be seen that the elaborate figures given by Courvoisier\* and Naunyn can only give a very imperfect estimate of the frequency of these fistulæ, which must be constantly overlooked or not recorded.

The authors named examined all the published cases, with the following results:

Fistulæ between the biliary passages themselves ...	8
"      "      "      "      and the stomach	12
"      "      stomach and the liver ...	4
"      "      "      "      gall-bladder ..	8
"      "      biliary passages and the duo-	
denum ...	108
"      "      duodenum and the common	
bile-duct ...	15
"      "      duodenum and the gall-	
bladder ...	93

\* *Beiträge zur Pathologie und Chirurgie Gallenwege.*



Out of a table of 10,866 autopsies made by Roth, Schröder, and Schloth, biliary fistulæ occurred forty-three times :

It would be of greater value if we could give statistics of the number of times that fistula follows operation, but this is seldom mentioned by operators.

The operations appended below extend to 536 cases, of which 416 were cholecystotomies. In 18 cases there were fistulæ following, but as 5 occurred in the first ten operations, since which time the method of procedure has been altered, it is fairer to say that 13 occurred in 406 cases.

Several of the fistulæ were inevitable, as the ducts were strictured; in others they were intentional, as in cancerous obstruction producing jaundice. Where the patients lived—*i.e.*, where the obstruction was due to simple and not

malignant disease—they were for the most part treated by further operative measures.

**Biliary Cutaneous Fistula.**—Courvoisier's statistics gathered from reported cases would seem to prove that this is the commonest form of fistula. It may be pathological or post-operative.

(a) **Post-operative fistulæ** may be mucous or biliary.

**Mucous fistulæ** are occasionally seen after the operation of cholecystotomy, where the obstruction in the cystic duct has not been overcome, or where that duct is the seat of stricture. In Case 1 the patient has had so little inconvenience that she does not think it worth while to undergo any further treatment.

In two other cases of mucous fistula (Cases 22 and 65) dependent on stricture of the cystic duct, the gall-bladder was removed, and this effected a complete and permanent cure.

In another case, where a muco-purulent fistula had been discharging at the umbilicus for some months, the channel was followed up to the gall-bladder, and the cystic duct found occluded by calculi, which were subsequently removed, when the fistula closed without difficulty (Cases No. 79 and 109).

A mucous fistula, as a matter of fact, causes very little inconvenience, as only about 1 ounce of fluid is discharged daily; but if the opening be allowed to close, the accumulation produces pain, and it is therefore necessary for a patient under these circumstances either to wear a small tube and a pad of absorbent wool or to submit to operation.

The operation of cholecystotomy will not be followed by fistula (except in the case of stricture) if the bile-ducts have been cleared, and if the opening in the gall-bladder be sutured to the aponeurosis and not to the skin. Since the operation of cholecystotomy was modified\* in this way—which was done after Case 10—no fistula has followed when the bile-ducts have been cleared.

**Biliary fistula** following on operation is quite a different matter from mucous fistula, as although in some cases it is compatible with good health, the inconvenience caused by 30 ounces of bile flowing from the fistula daily produces

\* This was first suggested and carried out by the author, May 2, 1889.

so much discomfort that in all the cases which have come under our notice the patients have preferred to accept the risks of operation rather than to retain their disability.

The treatment of biliary fistula should, where possible, be effected by removing the cause; but, as in certain cases this is impracticable or impossible, other means have to be considered.

If the ducts be clear, and the fistula be small, the application of the actual cautery to the margin of the fistula will frequently result in its closure. That failing, the method adopted in Case 116 may be followed, of opening the abdomen, detaching the gall-bladder, and suturing the opening.

Or the less severe method may be first tried, of dissecting the fistula from the skin margin, without opening the peritoneum, afterwards doubling in the mucous edges, suturing them accurately, and over this applying one or two layers of buried sutures before bringing together the skin.

Where, however, the ducts cannot be cleared, and the gall-bladder is large enough to permit of it, the operation of cholecystenterostomy may be performed.

This operation was first performed in a case of biliary fistula (Case No. 13) on January 14, 1888, and the patient is at the present time in excellent health, doing duty as a maternity nurse. Case 121 is another good example.

If the fistula be dependent on gall-stones or fragments in the ducts, the ducts may be syringed through daily with olive oil, or with a 0.5 per cent. solution of *sapo animalis*, as recommended by Dr. Brockbank; or a solution of turpentine in ether may be used, as in Case No. 23.

This is easily done by employing a small flexible catheter, which is passed through the fistula as far as it will go without force. To the end of this a syringe is affixed, and the medicament steadily syringed directly on to the obstruction, the syringing being repeated night and morning for a time.

After some experience of this method, I am compelled to say that it is very disappointing, and as a rule it will be necessary to perform a further operation for the removal of the cause.

(b) **Pathological surface fistulæ** usually open at the umbilicus, the abscess following the course of the remains of the umbilical vein, as in Case 79, but they may form at any part of the abdominal wall, even near the pubes, or on the left side of the abdomen.

Calculi of various sizes and numbers, from a single one 3 inches in diameter, reported by Gutteridge,\* to multiple small faceted concretions, the size of shotcorns, may be discharged in this way, leading to recovery and permanent cure, but until all the calculi are discharged the fistula is liable to remain open.

In operating on these cases, it is advisable to purify the fistula as far as possible, and to scrape away all granulations before opening the peritoneal cavity to get at and clear the bile-ducts. By adopting these precautions no untoward results are likely to occur.

Biliary intestinal fistulæ, as might be expected from the contiguity of the gall-bladder to the duodenum and colon, are the most common, and as a rule they are due to ulceration produced by gall-stones. Usually the ulceration proceeds quietly and produces very few symptoms, until, it may be, the gall-stone sets up obstruction in its passage down the intestinal canal, or after the formation of the fistula all the symptoms of gall-stones may pass away, and the patient make a complete recovery. If, however, any gall-stones have passed into the cystic or common ducts, the symptoms are likely to recur as the fistula contracts. The case of Mr. I., related on p. 114, is an example.

Doubtless in that case, after the serious illness associated with fever and local peritonitis, some gall-stones had ulcerated their way from the gall-bladder into the duodenum, and had been passed at stool, leaving a fistula, which drained the infected bile into the bowel, and so saved the patient from infective cholangitis, for at the same time other gall-stones had passed into the common duct and obstructed it.

So long as the gall-bladder duodenal fistula was open no serious harm resulted, but when the opening tended to heal and close (at the time of operation it would only admit the

\* *Lancet*, 1878 vol. i., p. 851.

passage of a small probe) the infected bile was unable to escape, and was retained in the ducts within the liver, setting up symptoms of infective cholangitis, as well as chronic pancreatitis, from the same condition applying to the duct of the pancreas.

The closure of the fistula into the duodenum, with the removal of the gall-stones, the ablation of the gall-bladder, and the drainage of the hepatic duct, effected a cure, and the patient is now well.

The process of ulceration, though at times performed quietly and without serious illness, is not always accomplished without symptoms, such as pain over the liver, more or less jaundice, and fever of an irregular type, to be subsequently followed by signs of more or less complete obstruction of the bowel.

Hæmorrhage into the stomach or intestines may occur in these cases.

If the fistula is between the gall-bladder and duodenum, 'the most common variety,' the whole length of the intestinal canal has to be traversed by the concretions; hence such cases are found to be more frequently associated with obstruction than when the fistula is between the gall-bladder and colon, for in the latter case the passage to the anus is usually accomplished without difficulty, though occasionally the concretions may lodge and cause trouble.

When a gall-stone is impacted in the common duct just before entering the duodenum, ulceration and perforation of the duct are apt to occur, the concretion thus escaping into the duodenum by an enlargement of the ostium of the common bile-duct from ulceration or sloughing.

Roth, who has paid special attention to this condition, found it five times in twenty-five cases of biliary fistula.

These gall-stones are usually smaller than those causing gall-bladder intestinal fistula, are seldom larger than filberts, and do not often cause intestinal trouble.

Nearly all the museums have in them examples of gall-bladder duodenal fistula. Specimens Nos. 2,827 and 2,828 in the College of Surgeons Museum are good examples.

No. 2,826 shows a gall-stone in the act of extrusion, and

it will be seen that the margins of the opening are ulcerating to allow of the passage. Death occurred after six weeks of suffering (Fig. 35).

No. 1,399 in Guy's Museum is a specimen of Dr. Hale White's, showing a gall-bladder duodenal fistula 1 inch from the pylorus, large enough to admit the finger; and 33 inches above the ileo-cæcal valve is a large gall-stone impacted in the ileum.

Nos. 2,261 and 2,262 in St. Bartholomew's Museum show gall-bladder duodenal fistulæ.

No. 1,676 in King's College Museum shows a gall-bladder duodenal fistula. Death occurred from peritonitis, though the gall-stone had passed *per anum*.

No. 1,595 in the Middlesex Museum shows a gall-bladder duodenal fistula, through which gall-stones passed. Death occurred from intestinal obstruction.

**Gall-bladder colic fistulæ** are less common in the museums, probably because they do not often cause death. There are, however, a sufficient number of examples to show that even this method of discharging gall-stones is not altogether safe.

Specimen No. 2,809A in the Royal College of Surgeons Museum is an example of gall-bladder colic fistula caused by carcinoma (Fig. 32, p. 112).

No. 1,589 in the Middlesex Museum shows a gall-bladder colic fistula from a woman of sixty. Death occurred from cancer of the uterus, though five months previously she had had violent abdominal pain accompanied by retching, indicating the time the fistula formed (Fig. 36).

No. 864 in the Charing Cross Museum shows a gall-bladder colic fistula, with secondary perforation, and death from peritonitis. Case 304 is an example.

**Biliary-gastric fistula** is less common than might be thought, for the pylorus is not infrequently adherent to the gall-bladder. I saw a case of this nature in which the vomiting of gall-stones made the diagnosis probable, though the complete recovery of the patient, a woman of fifty, rendered it impossible to be absolutely certain that the surmise was correct.

# PLATE XIII.



FIG. 35.—GALL-STONE IN ACT OF EXTRUSION INTO DUODENUM, THE EDGES OF THE OPENING BEING ULCERATED.

(No. 2,826, Royal College of Surgeons Museum.)

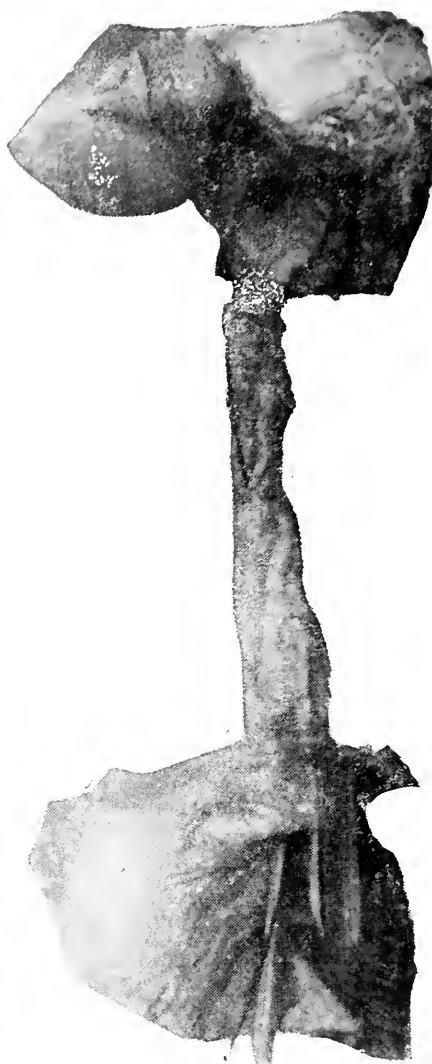


FIG. 36.—A PORTION OF LIVER WITH GALL-BLADDER AND A PIECE OF THE TRANSVERSE COLON.

The gall-bladder is much elongated and narrowed; its fundus is adherent to the transverse colon, and communicates with it by a circular orifice.

(No. 1,589, Middlesex Museum.)





A second case (No. 219) is of great interest, as, besides the symptoms of recurring pain depending on gall-stones, the patient, a lady, aged sixty, suffered from constant dyspepsia, with frequent vomiting and steady loss of flesh. At the operation the stomach was found firmly adherent to the gall-bladder, and on separating the adhesions, a fistula between the gall-bladder and stomach was found. The edges of the ulcer in the stomach were pared, and the opening closed with two rows of sutures; while the opening in the gall-bladder was utilized for removal of the gall-stones and afterwards for drainage. The patient made an excellent recovery, and is now in good health.

The Middlesex Museum has a specimen of gall-bladder stomach fistula (No. 1,595).

Murchison was of opinion that all vomited gall-stones must have entered the stomach through a fistula.

In one case, Jeaffreson\* found such a fistula post-mortem, a gall-stone having been vomited some time before. Mr. Page's case, previously referred to, is an example.

No. 1,706<sup>1</sup>, King's College Museum, is a specimen from a case which died seven to eight weeks after gall-stones were removed from the pleural cavity by Professor Rose, but no communication was found after death between the gall-bladder and pleura.

Of the rarer forms—biliary urinary, biliary vaginal, biliary thoracic, biliary pulmonary, biliary pericardial, biliary mediastinal, biliary pleural, biliary retroperitoneal, biliary portal, hepato-gastric—which are pathological curiosities, reference may be made to cases collected by Courvoisier, Naunyn, Murchison, etc.

I have recently operated successfully on a biliary pulmonary fistula by removing the cause of obstruction, a gall-stone in the hepatic duct. See Case 508.

### KINKING OF THE BILE-DUCTS.

Cases have been from time to time recorded by various authors, of obstruction of the bile-ducts caused by kinking or bending of the ducts. Virchow stated that in prolunga-

\* *British Medical Journal*, May 30, 1868.

tion of the right lobe of the liver (Riedel's lobe, corset lobe) in women, he had seen during pregnancy that this lobe became folded over against the under surface of the liver, carrying with it the gall-bladder. This bending of the gall-bladder had caused traction on the bile-ducts, occlusion of the lumen, and retention, with jaundice. Courvoisier mentions bending of the cystic duct at its origin as a cause of distension of the gall-bladder. He further mentions that the permanency of a biliary fistula following cholecystotomy with normal bile-ducts may be due to traction of the gall-bladder, causing a bend at the upper end of the common duct, so that the hepatic duct is in a line with the cystic duct, resulting in all or most of the bile passing out through the fistula, and little or none through the common duct.

Case 116 was probably an example, for there was nothing in the shape of organic obstruction to account for the fistula, which was readily cured by a simple plastic operation.

Komitsky reported the case of a girl, aged twenty-one, upon whom he operated for a supposed hydatid cyst of the liver with jaundice. The cyst turned out to be an immensely dilated common bile-duct, which was stitched to the surface and drained (choledochostomy). The patient died, and at the autopsy it was found that the condition was due to a bend of the common duct at the point where it enters the wall of the duodenum. Komitsky believed that this bend caused a valve-like occlusion of the duct, and he called attention to the analagous condition of valve formation in the upper end of the ureter, where it originates from the pelvis of the kidney.

Douglas, in 1852, found the following condition at the autopsy of a girl, aged seventeen, who had suffered from jaundice, fever, and a painful tumour in the right hypochondrium. The common duct was dilated to a large sac containing half a gallon of offensive bile. The walls of the sac were thickened and the openings of the hepatic and cystic ducts dilated so as to permit the passage of a finger. At the lower end of the large sac, towards the duodenum, there was a small opening leading into a normal undilated

duodenal portion of the common duct, at the upper end of which a sort of valve was found.

Seiffert also reports a similar case to the above, occurring in a woman of twenty-three.

Those cases of catarrh of the gall-bladder producing attacks resembling cholelithiasis without gall-stones, but associated with movable right kidney, probably owe their origin to kinking of the bile-ducts due to dragging by the displaced kidney. Case 45 is an example in which cure was effected by the performance of cholecystotomy, with the subsequent wearing of a belt, and Case 525 is another example in which the remedy was found in cholecystotomy and nephropexy.

## CHAPTER V

### INTESTINAL OBSTRUCTION

INTESTINAL obstruction from gall-stones is such a distinct complication of cholelithiasis, calling for special treatment, that it will not be beyond our province to consider it, and as the chief variety of obstruction is necessarily associated with fistula between the bile passages and intestines it seems convenient to place it here.

So much has been written about obstruction from gall-stones that at first sight it might seem to be a common ailment. Such, however, is not the case, as may be gathered from the fact that on inquiring of the registrars and pathologists it was found that only four such cases had been treated during a period of twelve months in some of the largest hospitals in the kingdom, representing 80,000 in-patients and several hundred thousand out-patients attended to during the same time.

Again, only one case, according to Dr. Brockbank, had occurred in the Manchester Royal Infirmary between 1883 and 1896, during which time 50,000 in-patients had been treated.

Professor Osler ('System of Medicine'), quoting Fitz, says that it occurs once in every thirteen cases of intestinal obstruction (23 in 295 obstructions). Leichtenstern says once in every twenty-eight obstructions (41 out of 1,152). Mr. H. L. Barnard, quoting from the statistics of the London Hospital ('Annals of Surgery') for eight years, says that out of 360 cases of intestinal obstruction there were eight cases of obstruction from gall-stones, otherwise one in forty-five cases.

There are clearly four classes of obstruction of the intestines depending primarily on gall-stones, though by intestinal obstructions from gall-stones is usually understood the impaction of a large concretion in some part of the intestinal tract, producing a mechanical block.

1. Obstruction depending on the mechanical occlusion and the injury to the bowel produced by the passage of a large gall-stone along the intestinal canal.

2. Obstruction due to volvulus, dependent on the violence of the colic caused by a gall-stone attack or induced by the passage of a large concretion down the intestinal canal.

3. Obstruction depending on adhesions left after local peritonitis in the gall-bladder region, or on stricture due to the healing of a fistulous opening between the gall-bladder and intestine.

4. Obstruction dependent on local peritonitis in the gall-bladder region, leading to paralysis of the intestine.

The first class is the most important variety of obstruction dependent on gall-stones, and is the one furnishing not only the greatest number of cases, but a considerable number of museum specimens. It is dependent on the mechanical obstruction and damage to the bowel produced by the passage of a large concretion through the intestine or by its impaction.

Impaction of a gall-stone may occur at any point in the intestinal canal, though it happens most frequently in the small intestines at or near the ileo-cæcal valve. As the intestinal canal lessens in calibre from above downwards, until at the ileo-cæcal valve the narrowest point is reached, we may expect the largest gall-stones to produce high obstruction and the smaller ones to pass into the ileum or to the valve before setting up any disturbance.

The occurrence of obstruction depends not only on the size of the stone, but also on spasm of the bowel above and below the obstruction, and on inflammatory changes in the wall of the bowel and in the mucous folds; hence it follows that obstruction does not necessarily follow immediately on the entrance of the calculus into the lumen of the gut, but may be delayed for some time, possibly even for weeks, as in

some of the cases related by Karewski (*Centralblatt f. Inn. Med.*, December 14, 1901; abstracted in the *Medical Review* for 1902).

CASE 1.—A man, aged fifty-six, had several attacks of biliary colic; in the last there was fæcal vomiting. Copious enemata brought away a stool. Five weeks later all the symptoms recurred, and were again removed by gastric and intestinal irrigation. Pain, however, persisted until six months later, when a large gall-stone was passed.

CASE 2.—A woman, aged seventy-three, who in youth had suffered from 'cramps in the stomach,' was suddenly seized with violent pains in the gastric region and vomiting. The vomited matter rapidly became feculent, and there was complete intestinal obstruction. Under enemata she improved, but pain persisted in the lower abdomen. Pyrexia and a palpable swelling appeared. This was incised, and yielded pus mixed with gas and a large gall-stone. Convalescence was prolonged by a colic fistula, which eventually closed.

CASE 3.—A woman, aged thirty-seven, had symptoms of chronic intestinal obstruction for several years, which occasioned acute exacerbations. The diagnosis lay between chronic cholelithiasis and the results of perforation of a gastric ulcer. Laparotomy was performed. Between the matted coils of intestines was an abscess containing two gall-stones.

CASE 4.—A woman, aged sixty, had suffered for twenty-two years from pain in the left side of the abdomen, occasionally accompanied by bilious vomiting. There had never been colic. The attacks of vomiting became more and more frequent, and finally were accompanied by intense pain and fæcal vomiting. Fæces and flatus were still passed. Temporary improvement followed gastric and intestinal irrigation. Laparotomy was performed, and an impacted gall-stone was removed from a coil of small intestine. Fæcal vomiting persisted for thirty-six hours after the operation, but convalescence was thereafter uninterrupted.

In a paper\* I read before the Royal Medical and Chirurgical Society in 1894 were related notes of cases illustrating

\* *Transactions of Royal Medical and Chirurgical Society*, 1894.

this condition. The following case is quoted *in extenso* from the paper :

‘On September 13, 1894, I received a telegram from Dr. Tempest Anderson and Dr. Raimes, of York, to go prepared to operate on a case of acute intestinal obstruction, but on arrival word was brought to the station that the patient was in a state of collapse, and might be dead on our reaching the house.

‘Fortunately, however, we went, and as a result of a morphia injection administered by Dr. Raimes before our arrival the pulse had recovered itself, and the patient was a little better. She was a lady of fifty, and gave a characteristic history of gall-stone attacks without jaundice for over ten years, but during the past year she had been much better, until Saturday, September 8, when she was seized with violent pain in the centre of the abdomen of a colicky nature, which was slightly relieved by opium; the pain, however, soon recurred, and was accompanied by vomiting, which became fæcal on Monday, the 10th.

‘Despite morphia and other means, the symptoms persisted, and on Wednesday, the 12th, chloroform was administered, and abdominal massage with abdominal succussion was employed, but without relief.

‘When I saw her at 10.30 on the evening of Thursday, the 13th, her pulse was rapid and intermittent, and she looked extremely ill, though she was temporarily relieved by the morphia which had been given a little time before our arrival.

‘There was no distension of the large bowel, but visible coils of small intestine pointed to some obstruction in the lesser gut, and we all agreed that operation was our only course. At 1 a.m. on September 14 the abdomen was opened by a 1½-inch incision below the umbilicus, and almost immediately a hard lump was felt inside a coil of small intestine at the bottom of Douglas’s pouch. This loop was brought through the abdominal incision, and surrounded by gauze wrung out of carbolic lotion.

‘After emptying the gut by pressure, Dr. Anderson grasped the proximal and distal ends between his fingers

and thumbs. I then incised the bowel, and the stone was extruded, the opening in the gut being closed by a continuous catgut suture for mucous membrane, and a continuous silk suture for the serous coat. The surface of the bowel which had been exposed was then bathed with boracic lotion and returned, and the abdominal incision closed in the usual way.

‘From beginning to end the operation occupied but twenty minutes, and the patient was put into bed in much better condition than she was in before the operation. The wound healed by first intention, and there was nothing to chronicle in the after-progress of the case, the patient being now quite well. The stone weighed  $1\frac{1}{4}$  ounces when dry, and measured 3 inches in circumference in one direction, and  $4\frac{1}{2}$  inches in circumference lengthwise.’

The following eight cases from the records of the London Hospital (1893 to 1901), reported by Mr. H. L. Barnard in the *Annals of Surgery*, 1901, are of great interest :

CASE 1.—R. F., woman, aged thirty-seven; admitted January 13, 1901. Good health up to nine months previous. No biliary colic, no jaundice, no obstruction. During last nine months suffered from aching pain in right hypochondrium. Absolute constipation from January 11 with vomiting; tenesmus; vomiting incessant, profuse, and stercoraceous.

*On examination*, little distension, no tenderness. Mass felt in Douglas’s pouch taken to be fæcal.

*Operation*.—Stone found impacted 5 feet from ileo-cæcal valve; removed through incision in gut; wound of intestine closed by two layers of sutures; abdomen closed without drainage. Bowels opened on second day. Recovery uninterrupted.

*Measurements of Stone*.—Length,  $2\frac{1}{2}$  inches; diameter,  $1\frac{1}{8}$  inches; circumference,  $3\frac{1}{2}$  inches; weight, 294 grains.

CASE 2.—M. M., woman, aged sixty-three; admitted June, 1901. Clear history of biliary colic for years, but no jaundice. Five days’ abdominal pain with vomiting, the latter being feculent; incomplete constipation.

Patient in bad condition (bronchitis); feeble pulse; no dis-



tension, and very little tenderness; no tumour felt by abdominal, vaginal, and rectal examination.

Diagnosis of impacted gall-stone in intestine.

*Operation*.—Stone found impacted 5 feet from valve. Removed in same way as previous case—suture of intestine; no drainage.

Death twenty-four hours after operation.

*Post-mortem*.—Loculated gall-bladder, containing several small and one large gall-stone; fistula between gall-bladder and second part of duodenum; common duct normal.

Stone removed from intestine barrel-shaped and faceted at both ends. Diameter,  $\frac{7}{8}$  inch; circumference, 3 inches; weight, 103 grains.

CASE 3.—I. P., woman, aged sixty-eight, admitted September 11, 1901. Two months' illness, with severe abdominal pain and jaundice. Five days before admission severe abdominal pain and profuse vomiting; absolute constipation for two days. Patient collapsed and almost pulseless. Abdomen soft; no distension or tenderness; no tumour to be felt; no jaundice.

Diagnosis of gall-stone obstruction.

*Operation (under cocaine)*.—Ten feet from valve gall-stone impacted; removed; Paul's tube fastened into intestine. Death in forty-eight hours.

*Post-mortem*.—Large ragged-edged fistula between gall-bladder and first part of duodenum; cystic, hepatic, and common ducts dilated; stone impacted in common duct. Calculus, large, rough, barrel-shaped. Length,  $1\frac{3}{4}$  inches; diameter,  $1\frac{1}{4}$  inches; weight, 234 grains.

CASE 4.—H. G., woman, aged seventy-three, admitted January 3, 1894, under Mr. Openshaw. Four days before admission she was seized with sudden paroxysmal pain in the region of the umbilicus, and this had persisted. Vomiting constant for three days and feculent. Constipation complete for five days. Abdomen a little distended; no tumour felt.

*Operation*.—Gall-stone impacted in ileum 1 foot from the valve. Intestine thin and ulcerated; gall-stone removed by incision, and wound closed by Lembert sutures. Death four hours later; no post-mortem.

CASE 5.—G. S., male, aged forty-two, admitted March 19, 1894, under Mr. Eve. Eighteen years before severe attack of epigastric pain, accompanied by tenderness and vomiting. During next seven years attacks of pain in abdomen. During next ten years obstinate constipation with dyspepsia. (Mr. Eve thinks that the stone was in small intestine during this period.)

Four days before admission severe pain, with continuous vomiting and absolute constipation, appeared suddenly. Under anæsthetic, hard bullet-like lump felt in right iliac fossa.

*Operation.*—Gall-stone impacted at ileo-cæcal valve pushed up into ileum, and removed through incision; wound closed by suture. Recovery. Length of calculus,  $1\frac{1}{2}$  inches; diameter, 1 inch; circumference,  $3\frac{1}{4}$  inches; weight, 190 grains.

CASE 6.—E. S., woman, admitted November 6, 1895, under Mr. Jonathan Hutchinson, junr. Clear history of attacks of jaundice and biliary colic. Four days before admission, sudden and acute pain in the right hypochondriac region, with vomiting, continuous and latterly feculent; constipation; slight jaundice; abdomen tender and distended.

*Operation.*—Gall-stone impacted several feet above ileo-cæcal valve. Enterotomy; three stones removed, one large and two small. Wound sutured. Recovery. Length of calculus,  $1\frac{3}{4}$  inches; diameter, 1 inch; circumference,  $3\frac{1}{8}$  inches; weight, 191 grains.

CASE 7.—H. S., male, aged fifty-two, admitted October 26, 1898, under Mr. McCarthy, in a dying condition, on tenth day of acute obstruction. No operation.

*Post-mortem.*—Large gall-stone impacted in ileum 25 inches from cæcum; fistula between gall-bladder and duodenum.

CASE 8.—S. N., woman, aged fifty, admitted November 27, 1899, under Mr. Openshaw. Twelve months previously had severe attack of abdominal pain, accompanied by vomiting; six or seven similar attacks during the year. Present attack commenced ten days before admission with 'spasms' and sickness. Distended abdomen; absolute constipation and feculent vomiting.



PLATE XIV.

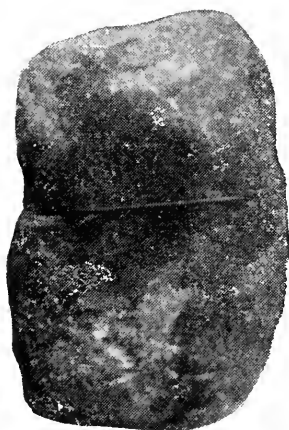


FIG. 37.—LARGE GALL-STONE PRODUCING ACUTE INTESTINAL OBSTRUCTION  
SUCCESSFULLY REMOVED BY ABDOMINAL SECTION.

(No. 2,436A, Royal College of Surgeons Museum.)

*To face p.149.*

*Operation.*—Gall-stone in ileum. Enterotomy; stone removed; wound closed by sutures. Death forty-eight hours later.

*Post-mortem.*—Fistula between gall-bladder and first part of duodenum.

Mr. Lund reported a case\* in which he had successfully removed a large concretion by enterotomy. The interesting points in this case are that there never had been any previous history of jaundice or colic, nor any recollection of a feeling of uneasiness in the region of the gall-bladder. The obstruction was caused by a gall-stone fixed in the ileum, and lying near the brim of the pelvis. The measurements of the gall-stone, which was the shape of the gall-bladder, were: Long diameter,  $1\frac{5}{8}$  inches; transverse, 1 inch; longitudinal circumference,  $4\frac{1}{2}$  inches; transverse,  $3\frac{1}{4}$  inches.

Dr. Everley Taylor reported a successful operation in the *Lancet*, and the very large gall-stone removed is in the Hunterian Museum, No. 2,436A (Fig. 37).

It is astonishing how few unsuccessful cases are reported, yet we know that the mortality of these operations has been considerable. The following case (*British Medical Journal*, March 9, 1895), reported by Dr. Kinneir, of Horsham, is worth noting:

Mrs. B., aged fifty-seven, was taken with sudden abdominal pain, followed by sickness, on January 14. On the following morning she passed two loose motions. The sickness continued, and stercoraceous vomiting commenced on January 17. Dr. Kinneir was called in to see the patient on January 20 by the family medical attendant, and performed laparotomy on January 21. He found a large gall-stone impacted in the upper part of the ileum, which he removed by enterotomy. After the operation the sickness ceased for some hours; the patient was conscious, expressed relief, and took some nourishment. About six hours later she vomited, but not fæcal matter. This continued at intervals during January 22, and on the morning of January 23 the vomit became again stercoraceous and very offensive. She died on the afternoon of that day. There was no swelling of the abdomen, before

\* *Lancet*, July 11, 1896.

or after the operation, and very little pain; the temperature was normal throughout.

Very little urine was passed, and constipation was complete from January 15, in spite of medical treatment. She passed flatus frequently before she died. After the operation she was fed on soda-water, some brandy, and nutrient suppositories. Morphine was injected hypodermically. The gall-stone was covered with a layer of hard fæcal matter. It measured  $1\frac{1}{4}$  inches in diameter; its weight was  $2\frac{3}{4}$  drachms. On section it presented the usual striated centre, getting darker towards the circumference.

*Post-mortem.*—The median incision had begun to unite; there was no trace of peritonitis, and no serum or fluid in the cavity. The wound in the intestine was quite unchanged; the small intestine nearly down to the cæcum was distended. There was no other sign of obstruction from the duodenum to the anus. The mesentery, at the seat of the obstruction, and the intestine itself, were of a dark green colour.

Sendler (*British Medical Journal Supplement*, April 20, 1901) performed abdominal section for intestinal obstruction, and found the ileum, at a point about 8 inches above the ileo-cæcal valve, totally obstructed by a gall-stone of the size of a hen's egg. On the eighth day after the operation a fæcal fistula developed in the abdominal wound, and on the tenth the patient died of collapse. No trace of peritonitis could be detected, but a minute gap was found in the line of suture in the ileum at the point where it touched the abdominal parietes.

The following, among other cases which we could relate, will serve to illustrate the passage of gall-stones without operation, after causing symptoms of intestinal obstruction. On August 26, 1895, I saw with Dr. Lever, of Harrogate, a lady of seventy-three, suffering from acute intestinal obstruction of three days, with fæcal vomiting of twenty-four hours' duration. As there was a previous history of gall-stone attacks years before, and as the pain of the present attack started over the hepatic region, it was decided to wait and treat the case medically, with the result that a large gall-

stone was passed naturally after two days, and the patient made a good recovery.

In a case recorded by Dr. C. Martin the patient suffered from absolute obstruction for six days; vomiting was severe and finally stercoraceous. On the morning of the seventh day a motion was passed, followed by the evacuation of a large stone. The patient rapidly recovered. The concretion had a circumference of  $3\frac{1}{2}$  inches.

Mr. E. W. Palin's case, reported in the *Lancet* for May 12, 1900, is of interest as illustrating a case occurring in an aged patient.

A woman, aged eighty years, was suddenly seized with symptoms of acute intestinal obstruction, which persisted in spite of treatment until the sixth day, when complete relief followed the passage of a gall-stone measuring a little over 1 inch in diameter by  $\frac{3}{4}$  inch in thickness, nearly round, and well saturated with fæcal material. Several smaller stones were passed, but unfortunately they were lost. There had never at any time in the patient's life been any symptoms pointing definitely to gall-bladder trouble, but she passed through a very similar attack of obstruction some five or six years ago. Though the obstruction was complete for at least six days, her condition never became extremely bad. Distension slightly progressed from the third to the fifth day, but was never great. She did not suffer from shock. The pulse remained fairly strong for an old woman. The tongue was dry, but not brown. Vomiting was never fæcal; incessant at first, it latterly diminished in frequency, and she always sat up to vomit.

Israel performed laparotomy in a case of intestinal obstruction, and found a gall-stone in the lower ileum with a diameter of only 2 inches. It was assumed that the stone had caused a 'dynamic obstruction' by spasm (Treves, 'Intestinal Obstruction,' p. 194).

The following notes are descriptive of a case in the practice of a former Leeds house-surgeon, Dr. Wilkinson, of Anerley Hill:

'My patient is a lady of sixty-three, and the facts are, briefly: An attack of biliary colic, followed by symptoms

of acute intestinal obstruction, stercoraceous vomiting, etc. Obstruction lasted three weeks, giving way finally under rest, opium, and copious enemata; and three weeks later a gall-stone was passed *per vias naturales*, about the size of a pigeon's egg, and weighing 5 drachms  $41\frac{1}{2}$  grains. There was a well-marked facet on the stone, and the patient had only the faintest tinge of jaundice.'

In the Leeds Museum are stones from a case under the care of the late Mr. McGill, in which the calculi (Fig. 39), four in number, were passed after causing acute obstruction.

In making a study of the reported cases, and especially of museum specimens, one cannot help feeling astonished at finding fatal obstruction depending on quite small concretions, and the comparatively easy passage of very large gall-stones.

For instance, side by side in Guy's Museum are specimens, Nos. 1,456, 1,457, 1,458, and 1,459, showing by no means large calculi—one, in fact, only weighing 55 grains—all of which, nevertheless, caused fatal obstruction; and specimens, Nos. 1,449, 1,450, and 1,451, showing large stones safely passed *per anum*, though in one case the stone was  $3\frac{3}{4}$  inches in circumference, and in another 3 inches long and  $1\frac{1}{4}$  inches in diameter.

In a case of Dr. J. Blackburn's the stone,  $3\frac{3}{8}$  inches long by  $1\frac{1}{2}$  inches broad, actually produced no symptoms except when at the anus. The gall-stone is in the Hunterian Museum, No. 143A.

In the Hunterian Museum, No. 2,436, is shown a beautiful specimen of a gall-stone weighing 400 grains, and measuring 2 inches by  $1\frac{1}{4}$  inches, taken from a woman of fifty-two. The fistula between the gall-bladder and duodenum through which it had passed into the bowel is also shown.

In the Middlesex Museum are two of the most perfect specimens of the kind to be found (Nos. 1,493 and 1,595). No. 1,493 shows a portion of the middle of the ileum (Fig. 40). Impacted in it is a large, almost spherical gall-stone, nearly 4 inches in circumference. It has been sawn in half, and the upper fragment removed. The mucous membrane of the intestine corresponding to this has been



PLATE XV.

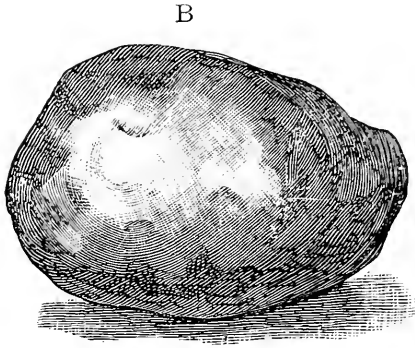
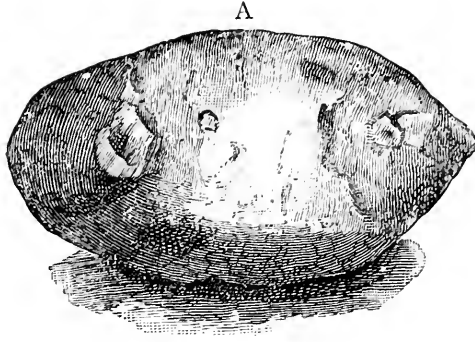


FIG. 38.

A, Drawing of gall-stone weighing 238 grains, causing acute intestinal obstruction, removed by laparotomy in Guy's Hospital. Death eight hours after operation. (Paper by Mr. Bryant, Clinical Society's *Transactions*, vol. xii., p. 106.)

B, Gall-stone passed after five days' symptoms of obstruction. Weight, 228 grains.



# PLATE XVI.

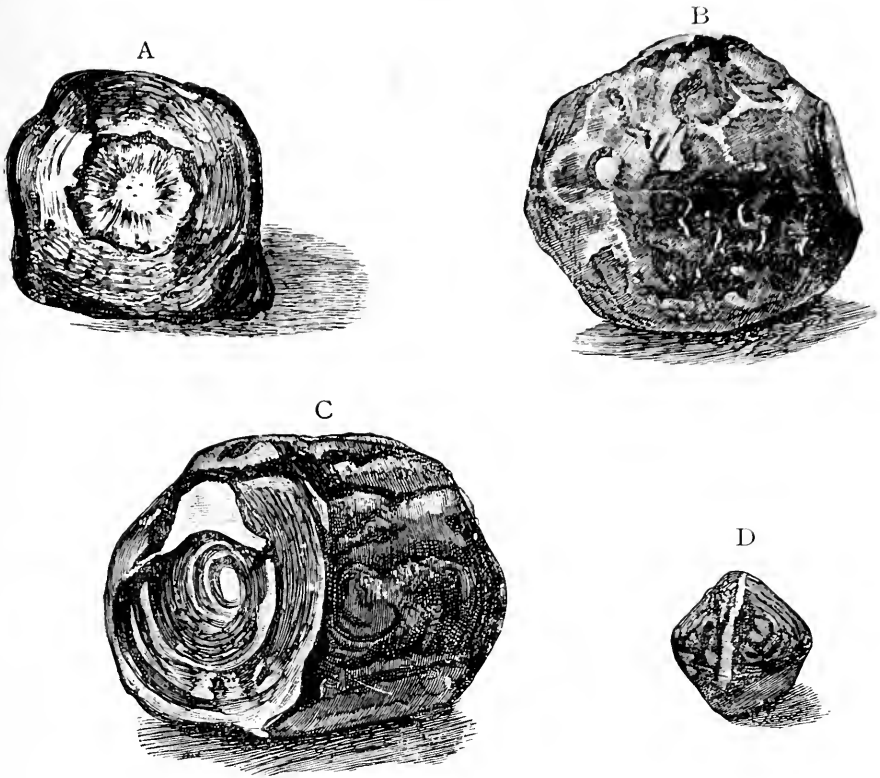


FIG. 38a.

A, A gall-stone which was voided by an old woman after a nine days' severe illness. It weighed 160 grains; and had a diameter of 1 inch and two lines. The case is described by Dr. Craigie in the *Edinburgh Medical Journal*, vol. xxii., p. 240. A synopsis of it is given in this work.

B, C, D, are given to illustrate a fatal case of chronic obstruction by gall-stones, and at the same time the great difficulties which attend diagnosis. The patient, a woman, aged fifty-nine, died of perforation of the ileum, just above the cæcum, eight months after the probable date of escape of the stones from the gall-bladder, and after eight weeks of incomplete obstruction. The symptoms had been vomiting, constipation, and severe griping pain, but they had been repeatedly relieved by treatment; the bowels had acted well, and at no time, until the last few days, had there been abdominal distension. There had never been jaundice, and the patient had usually enjoyed fair health. Eight months before her death she had passed through an attack of constipation, with great pain, and at that time a hard tumour could be felt in the right hypochondrium. At the autopsy the gall-bladder was healthy, and no conditions were found which threw any light upon the mode by which the stones had escaped. Each of the larger stones measured about 4 inches in circumference. There was no proof that any accretion had been received from the contents of the intestine.

It will be seen that in this case no permanent obstruction was caused, and that for months together the bowels acted well. Death was not from obstruction, but from perforation from ulceration. The fact that there were several stones, and some small, probably conduced to this result.

The case is recorded by Mr. Le Gros Clark in the *Medico-Chirurgical Society's Transactions*. It is republished in full, with other important illustrations of gall-stones, in the 'Pathological Atlas of the New Sydenham Society,' Fascic. vii.



PLATE XVII.



FIG. 39.—LARGE GALL-STONE PRODUCING ACUTE INTESTINAL OBSTRUCTION PASSED PER ANUM AS FOUR SEPARATE CALCULI, WITH RECOVERY OF THE PATIENT.

(No. 317A, Leeds Museum.)



FIG. 40.—LARGE GALL-STONE IMPACTED IN ILEUM, AND PRODUCING FATAL OBSTRUCTION.

(No. 1,493, Middlesex Museum.)



destroyed by ulceration. The intestine above the obstruction is dilated. Its peritoneal surface is partly covered with lymph. The gall-stone had passed into the duodenum through an ulcerated opening between it and the gall-bladder.

The patient was a woman, aged forty-six, who died in the hospital, January 31, 1856. Twelve days before her admission on January 29 she was seized with bilious vomiting, to which she was very liable. This lasted two days, when she was attacked by sudden acute pain in the right iliac region, and from this time she had no motion of the bowels, with the exception of some scybala brought away by an enema, till her death. The vomiting continued, and became stercoreaceous.

No. 1,595, from the same patient, shows a portion of a liver, with the gall-bladder, stomach, and duodenum.

The fundus of the gall-bladder is adherent to the first part of the duodenum, and a fistulous opening exists between them, through which a glass rod is passed.

The large gall-stone had escaped through the opening.

Schuller (Strasburg, 1891), in reviewing 139 published cases, found that the subjects were women in 74·3 per cent., and out of these 75 per cent. of the cases occurred in women over fifty, though instances were found from eighteen to ninety-four.

Lobstein, of Heidelberg (*Annals of Surgery*, January, 1896), gives the most common age between forty and sixty; Mr. Eve gives it as sixty-four, and Sir Frederick Treves as fifty-seven.

It is a curious fact that, although the calculi usually produce intestinal trouble within a few days of reaching the intestine, in some cases they may remain in the bowel for long periods—*e.g.*, in a case (*Transactions of Clinical Society*, 1895) of Mr. Eve's, ten years, and in one (*Lancet*, December 3, 1887) of Mr. Smith's, probably fifteen years.

Sir Frederick Treves, in connection with this matter, says that the concretions are liable to grow by deposition of salts and fæcal matter during their stay in the intestine.

In Courvoisier's elaborate statistics, out of fifty-three cases examined, he gives the site of obstruction as 21·4 per cent.

in the duodenum and jejunum, 65·4 per cent. in the ileum, 10 per cent. at the ileo-cæcal valve, and 2·4 per cent. in the sigmoid flexure.

Leichtenstern, from an examination of 32 cases, gives the following result. In the duodenum and jejunum, 10 cases; in the middle ileum, 5 cases; in the lower part of ileum, 17 cases.

Barnard (*loc. cit.*) arranges the cases quoted by Treves and those collected by himself according to the diameter of the stone and the point of obstruction :

Diameter of Calculus.				Point of Obstruction.
2 $\frac{1}{4}$ inches	-	-	-	Upper jejunum.
1 $\frac{1}{3}$ „	-	-	-	Jejunum.
1 $\frac{1}{4}$ „	-	-	-	Middle jejunum.
1 $\frac{1}{7}$ „	-	-	-	Lower jejunum.
1 $\frac{1}{8}$ „	-	-	-	Five feet up ileum.
1 inch	-	-	-	Several feet up ileum.
1 „	-	-	-	Ileum.
$\frac{7}{8}$ „	-	-	-	Five feet up ileum.
1 „	-	-	-	Ileo-cæcal valve.

Museum specimens amply demonstrate that the gall-stones producing obstruction of the intestine in nearly every case enter the bowel through a gall-bladder duodenal fistula. They rarely enter through the colon: only two specimens of the latter condition were found in the London museums, specimen No. 864, Charing Cross Museum, being one.

The disease is a peculiarly fatal one. Out of 280 cases collected by Schuller, Dufort, and Courvoisier, 156 died—*i.e.*, 52 per cent.

Kermisson and Rochard,\* out of 105 collected cases, gave the mortality as 50 per cent.

The cases that recovered lasted on the average 8 days, those that died 10 days, but the duration of obstruction may vary from 1 to 28 days.

Lobstein collected 92 cases. Of the 61 not operated on, 32 recovered, the remaining 29 died of peritonitis, or exhaustion; of the 31 operated on, 12 recovered; but, as many of

\* *Archives Générales de Médecine*, February, 1892.



the 19 which died were moribund when operated on, their death cannot be charged to operation.

Courvoisier collected 125 operations with a mortality of 44 p. c.

Schuller	„	82	„	„	„	„	56	„
Eve	„	28	„	„	„	„	40	„
H. L. Barnard	„	8	„	„	„	„	57	„

A case reported by Dr. Sargent in the *British Medical Journal*, 1879, apparently died from the intensity of the pain, after symptoms lasting only half an hour.

As more than one large concretion may be present in the gut at the same time, the symptoms of obstruction may recur once, twice, or three times after the first concretion has been parted with.

Dr. Maclagan (*Transactions of Clinical Society*, vol. xxi., p. 87) has described two cases of this kind, and Mr. Clutton (*ibid.*, p. 79) has described another, in which he operated successfully within twenty-four hours of the onset of the second seizure, and manipulated the stone through the ileo-cæcal valve.

*Symptoms.*—The symptoms are those of acute intestinal obstruction from other causes, with early fæcal vomiting and severe abdominal pain. Though the onset is sudden, the pain and collapse are frequently not severe until later in the attack, and the constipation may not be well marked, flatus and even fæces passing after the onset of acute symptoms.

Vomiting is always a marked symptom, and bile may be vomited in great quantity, as in a case of Dr. Pye-Smith's, quoted by Sir Frederick Treves, in which the patient vomited 10 pints of bile in forty-eight hours, and died on the sixth day from a gall-stone impacted in the jejunum. The higher in the gut the impaction, the more violent, as a rule, will be the symptoms and the less marked will be the distension. The obstruction can only very rarely be felt through the abdominal walls.

Although it is sometimes possible, as in Case 99, to make a probable diagnosis from the history of previous gall-stone attacks extending over several years, yet in many cases there is absolutely no previous history to guide one, and it is quite

impossible to say whether or not the attack is one dependent on the cause in question, or on a volvulus or band, or internal hernia, which, if left, must inevitably lead to death, and that speedily. The age and sex, together with the history of chronic dyspepsia and pain in the hepatic region, are, however, well worth bearing in mind, as well as the early and persistent vomiting and visible peristalsis, limited to the small intestines.

*Treatment.*—If the diagnosis could always be made with certainty, this is a condition in which medical and expectant treatment might be fairly given a trial, since we have ample evidence of large gall-stones having safely passed without other treatment.

But we must not forget that 52 per cent. of cases treated on medical and expectant lines are fatal, and although surgery has not yet shown a much greater percentage of recoveries, it is because surgical means are frequently only resorted to when the case is hopeless, and after all other means have been tried.

When it is borne in mind that there are no symptoms peculiar to this form of obstruction, and that the course pursued by an obstruction by a band or by an internal hernia may be exactly the same as in gall-stone obstruction, the surgeon who waits beyond the period when an operation may be undertaken with every hope of success is incurring a very serious responsibility.

Under the heading of treatment, Sir Frederick Treves says: As soon as symptoms of obstruction are pronounced, laparotomy should be performed. He advocates preliminary lavage of the stomach, and after removal of the stone he advises emptying the intestine above, and subsequent suture.

With regard to the method of treatment after the abdomen is opened and the cause found: if the gall-stone can be easily crushed through the intestinal coats, without too much force being required, it may possibly be justifiable, though it should be borne in mind that the bowel may be ulcerated and softened at the place of impaction, and that even the slight force required to crush a soft stone may

produce so much additional damage as to lead to gangrene and subsequent perforation. On the whole, therefore, I would urge enterotomy, either at or above the seat of impaction, and removal of the stone, as it can be done very quickly and with very little damage to the bowel.

Should the patient be too ill to bear a search being made for the obstruction, enterostomy, or perhaps short-circuiting, might be performed, in order to give temporary relief, the cause of the obstruction being afterwards removed, if this be not effected naturally.

As to *when* operation should be done, that is part of a general question which each surgeon will have to answer for himself in every individual case, as no definite rule can possibly be formulated which will apply to all cases. The surgeon will, as a rule, not be called in before decided symptoms of intestinal obstruction have manifested themselves, and until medical means have been fully tried. In such cases it would seem to me to be idle waste of time to delay surgical intervention until the patient is so exhausted that operation is only undertaken as a *dernier ressort*, when the subject is almost moribund. If, however, the case be seen at an earlier stage, morphia will have to be given to relieve the pain, and it will be well to recommend ext. belladonnæ in  $\frac{1}{4}$ -grain doses every four hours, the stoppage of all feeding by the mouth, and the administration of one or more large siphon enemas, given slowly with the buttocks elevated. If relief does not speedily follow, and the diagnosis is not clear, chloroform anæsthesia may assist in two ways: in the first place, it enables a thorough examination of the abdomen, and at times a diagnosis of the cause, to be made; and, secondly, the manipulation, if made methodically, may reduce a hernia or volvulus, or may possibly help onwards an obstruction. This failing, and the symptoms persisting, resort to operation should not be delayed, and at this comparatively early stage there will be every prospect of success.

**The second variety, volvulus of the small intestine**, dependent on the violence of the colic caused by an attack of gall-stones, or on the contortions induced by the passage of a

large concretion through the small intestine, is probably uncommon.

The following are abbreviated notes of two cases under my own care.

CASE 1.—Acute intestinal obstruction in a woman of sixty-eight; operated on November 12, 1890, by laparotomy, on the eighth day of the obstruction, a volvulus of the small

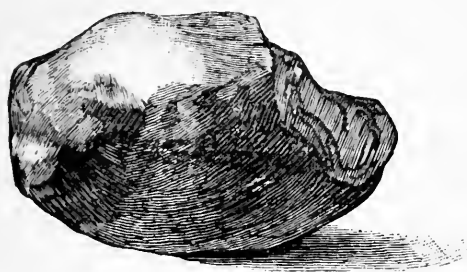


FIG. 41.—DRAWING OF GALL-STONE, ACTUAL SIZE, FROM CASE 30.

intestine being discovered and untwisted. Bowels moved by enema on the sixteenth day after onset of obstruction, and eighth day after operation, and a large gall-stone, 3 inches in circumference and  $1\frac{3}{8}$  inches long, was passed, this being manifestly the cause of the

obstruction, and secondarily of the volvulus. The patient returned home on the twenty-sixth day, and remained quite well when heard of a year subsequently. (Case No. 30. Fig. 41.)

CASE 2.—Mrs. O., aged sixty-two, was found to be suffering from acute obstruction of six, and fæcal vomiting of two, days' duration, the onset having started like a gall-stone attack, with pain over the gall-bladder, and later in the umbilical region. She gave a history of having suffered from attacks of gall-stones for several years, some of which had been followed by jaundice; and from the mode of onset of the present seizure, and the slight jaundice following it, she was quite sure the attack had been one of her old seizures at the commencement. From the persistence of the fæcal vomiting, the presence of visible intestinal peristalsis, and the pinched and anxious countenance, with the absence of relief by ordinary medical means, operation was decided upon. Laparotomy was performed, and volvulus of the small intestine being found, the loop of gut, which was much congested, was untwisted, and the abdomen closed. Flatus passed the same day, and the bowels were opened the next. The wound healed by first intention, and recovery was uninterrupted. (Case No. 88.)

*Diagnosis.*—In this class of cases (volvulus) a positive diagnosis is probably, for the most part, out of the question, except after the abdomen is opened, as volvulus of the small intestine is an extremely rare event, and we know that a large gall-stone may quietly ulcerate its way into the gut without any preliminary warning, the symptoms only arising when the concretion is passing through the small bowel; but in both cases related, in addition to the signs of acute obstruction, there was a well-marked localized swelling near the umbilicus, becoming hard during the paroxysms, pointing to the site of the obstruction; and in the second case there was not only the previous history of cholelithiasis, but the characteristic onset of a gall-stone attack, followed by acute symptoms.

*Treatment.*—In this form, operation holds out the only hope of success, as, the obstruction being mechanical, nothing short of remedying the cause can be of use.

**The third class** is characterized by obstruction coming on after the original cause has disappeared, and depends on adhesions left by local peritonitis due to gall-stone attacks; or on narrowing, caused by the healing of a fistula through which a gall-stone has made its way into the intestinal tract; or on chronic inflammation and ulceration of the bowel set up by the presence of a gall-stone.

A good example is afforded by Case 160, where adhesions of the colon to the gall-bladder led to constipation and attacks of partial obstruction, which were entirely cured by an operation in which the adhesions were separated.

In Case 199, though there were no gall-stones, an attack of typhoidal cholecystitis produced adhesions involving the colon, and led to the formation of a band which compressed the bowel and caused obstruction. The patient, Mrs. L. S., aged thirty-six, was admitted to the Leeds Infirmary with intestinal obstruction of a week's duration, which was relieved by  $\frac{1}{4}$ -grain doses of extract of belladonna and the use of enemata. Six months before this seizure she had a severe attack of typhoid fever, which was followed by steadily increasing constipation and the discharge of small motions, accompanied by a little blood and mucus. The patient, being

so much better under medical treatment, was discharged, but had to be readmitted on account of a return of the obstruction, with which she had been threatened on several occasions during the month she had spent at home under the care of her own medical man.

On admission, the abdomen was distended, and there was distinct tenderness in the right hypochondriac region. Though the symptoms were not so acute as when she was in the hospital before, it was decided to open the abdomen in order to discover, and if possible to remove, the cause of the obstruction.

The operation was performed through a median incision, and the transverse colon was found to be contracted along its whole course, to the size of the middle finger. The ascending colon and the small intestine were much distended, and when they were held aside two bands were found passing from the gall-bladder quite across the hepatic flexure of the colon, one of them completely encircling it. On division of these, the cause of the obstruction was removed, and the transverse colon immediately became distended. The abdomen was then closed. The bowels were opened on the day after operation, and before she left the hospital they were opened daily without aperients or artificial help of any kind.

In this case, the relation between the fever and the cholecystitis seems to be very clear, and it was probably only owing to the ducts being free that the more serious trouble of phlegmonous cholecystitis did not supervene at the time of the attack of typhoid, for the inflammation of the gall-bladder must have been very severe to have extended to the peritoneal coat, and led to the pouring out of so much lymph as the firm adhesions demonstrated.

Ward (Pathological Society's *Transactions*, 1852, p. 357) has placed upon record a case of cicatricial stricture of the ileum which was, without much doubt, due to the ulceration set up by impacted and long-retained gall-stones.

The following case, which came under my care, was one of thickening and ulceration of the bowel probably set up around

a gall-stone, and ultimately leading to chronic tuberculosis and stricture :

Miss H., aged fifty-one, seen with Dr. Petch, of York.

*Family history* on father's side negative, on mother's side decidedly tuberculous.

*Previous History.*—She appeared to overgrow her strength between the ages of ten and fourteen years. When ten years old she had a glandular swelling in the neck, which was incised. No cough until twelve or thirteen years ago, since which time she has been troubled by bronchial catarrh every winter. No perspiration at night. Has recently lost flesh and strength very considerably. For some fifteen or twenty years the patient has suffered from so-called 'bilious' attacks, accompanied by vomiting and pain across the abdomen, which would pass away after a few hours with diarrhœa. She had a bad colour at the time of the attacks, but had no apparent jaundice.

These attacks had occurred for some years, with perhaps a month's interval between each. Five years ago the character of the attacks appeared to gradually change, and three years ago their place was taken by a constant pain across the waist and back. The pain did not radiate, and was accompanied by indigestion and flatulence. She was subject to attacks of constipation for two or three days, followed by three or four days' diarrhœa, which would be accompanied by griping pain and would come on quite suddenly and unexpectedly. No distension noted, no tenderness during intervals of pain, no tenesmus, stools as a rule watery, slight bleeding from the bowel on defæcation five or six years ago, but no blood noticed since.

When seen by me on July 22, the patient was very thin, and it was easy to see vermicular contraction of the intestines, the tumour coming and going at varying intervals, the pain being at times very severe. On examining by the rectum, a nodular growth could be felt in Douglas's pouch, which was quite movable from side to side, and could be pushed out of reach.

Operation was advised, and was performed in York on July 26.

The abdomen was opened in the middle line, and the tumour previously felt by the rectum was discovered to be a coil of intestine, very much thickened and forming a mass as shown in the photograph, there being no less than four distinct strictures, the first within  $1\frac{1}{2}$  feet of the last, and all in the ileum. The affected area was brought through the incision, surrounded by sterilized gauze, and excised, the healthy bowel being sutured end to end over a decalcified bone bobbin.

I have not seen the patient since, but have heard that she recovered from her operation and gained flesh and strength, and is now well and strong.

The specimen removed was examined by Dr. Norman Smith, pathologist to the Leeds Infirmary, who gave the following report (Fig. 42).

‘There is a great increase of small round leucocytes and of connective tissue in the submucous layer. At places the leucocytes form dense, deeply stained aggregations. Seen by the higher powers, they are made up of a peripheral part composed of small cells, and a central portion of large cells. They are apparently giant-cell arrangements. At places in the muscular coat the same arrangement is commencing to be formed. At one point in the lumen of the bowel is seen a gall-stone imprisoned between two of the strictures. The question arises as to whether the irritation caused by the gall-stone may have initiated the tubercular disease.’

The specimen is an extremely interesting one, as showing how near to stenosis it is possible to get without complete obstruction; it shows a gall-stone entangled in a pouch between two of the strictures at the point marked X.

Dr. Brockbank refers to a case reported in the *Transactions* of the Pathological Society of London, 1852, in which there was chronic inflammation and thickening of the ileum and cæcum, with destruction of the ileo-cæcal valve, these being dependent on gall-stones found in the thickened and ulcerated bowel. The bowel was dilated above the obstruction and much contracted below.

The patient suffered from chronic diarrhœa for three years, which alternated with attacks of obstruction.



PLATE XVIII.

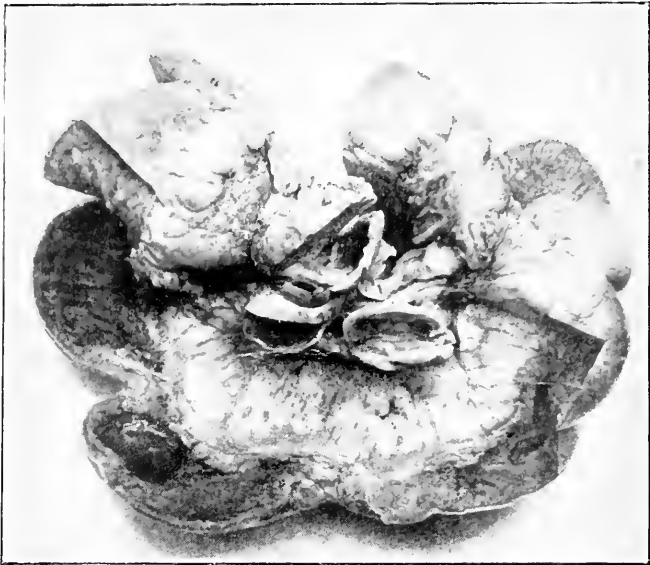


FIG. 42.—GALL-STONE IN LUMEN OF BOWEL BETWEEN TWO STRICTURES  
DUE TO CHRONIC TUBERCULOSIS.

(Specimen in Pathological Museum of Leeds Medical School.)

*To face p. 162.]*



In the **fourth variety** the symptoms may be so severe as to resemble strangulation by a band or acute intussusception. The diagnosis will not, as a rule, be difficult, as the history of the occurrence of previous attacks of spasms, though not of necessity followed by jaundice, the similarity to these of the commencement of the attack in question, the severe and persistent pain, at first localized to the right side of the abdomen, the absence of distension at the commencement, and then the occurrence of distension on the right side only, becoming general later, the lateness of the onset of fæcal vomiting, and only after continued retching, the existence of collapse at an early stage owing to the severity of the pain, which is usually relieved by a morphia injection, the usual absence of visible peristalsis, and, lastly, the onset of jaundice, if the concretions have reached the common duct, afford so much guidance that error will not often occur, especially if the patient be a woman of middle or old age. But that difficulties may arise is shown by the cases about to be mentioned.

Many cases of this kind are seen, but it will be necessary here only to mention three, as showing the difficulty in diagnosis and the extreme urgency of the symptoms.

CASE I.—The patient, Mrs. —, aged sixty, was sent by her medical adviser, Dr. H., into a surgical home in Leeds for immediate operation for acute intestinal obstruction, fæcal vomiting having been present for three days, and medical treatment having failed to give relief.

On arrival, she was too exhausted and ill to bear operation, and morphia was administered to relieve her distress and combat the collapse due to the intense pain.

Rectal feeding was at once begun in order to maintain the strength, and ext. bellad. was given every four hours in  $\frac{1}{4}$ -grain doses. The patient forthwith began to improve, and a clear history of cholelithiasis was obtained, this attack, the patient said, differing in no respect, except in severity, from those she had frequently had on former occasions. There was marked tenderness over the gall-bladder, particularly at a point one-third of the distance in a straight line between the ninth costal cartilage and the umbilicus, together with

some swelling in the right hypochondrium, slight tympanitic distension of the abdomen generally, some jaundice, and the history of a sudden onset followed by two or three slight ague-like attacks. Flatus passed the night of admission, and continued to pass at intervals.

After two days the bowels were freely relieved after a large enema had been administered. No large gall-stone was discovered, but several small concretions, which had evidently passed through the common duct, were found. She returned home in the third week, and has remained well.

CASE 2.—Mrs. R., aged fifty-six, was admitted on July 18, 1893, into the Leeds Infirmary, with symptoms of acute intestinal obstruction of three days' and fæcal vomiting of twenty-four hours' duration. The patient was jaundiced and was in very great pain, the pain having begun over the gall-bladder, radiating thence over the abdomen, and through to the right scapular region. She gave the history of having had numerous gall-stone attacks during the previous fifteen years, but she had never been so severely affected as on the present occasion.

A morphia injection, followed by  $\frac{1}{4}$ -grain doses of ext. bellad. every four hours, and rectal feeding, soon gave relief to the urgent symptoms, and the bowels were moved on the third day, after which recovery was uninterrupted. On October 21, 1893, the patient having completely recovered from the obstruction, but the spasmodic pain followed by jaundice having recurred, the abdomen was opened, and numerous adhesions of the colon and duodenum to the gall-bladder and bile-ducts were found.

Cholecystotomy was performed, and six stones were removed, others in the common duct being crushed between the finger and thumb.

The patient was discharged cured in a month, and has been well since (Case 78).

CASE 3.—A woman, aged forty-seven, was admitted into the Devon and Exeter Hospital on May 16, 1895, under the care of Mr. A. C. Roper.\* She had had no previous serious illness

\* *Lancet*, August 22, 1896.

or similar attack. The patient had been suffering great pain in her abdomen, accompanied by vomiting, for three days, and had taken various aperients, resulting in one action of the bowels the previous morning, which, however, did not give her any relief. An enema of 7 pints administered on the night preceding her admission to hospital was returned unstained. Her temperature was 99° F., and the pulse 100. She vomited bile and mucus.

Examination of the abdomen showed a visible swelling, freely movable, somewhat tender, elastic, and distinctly resonant to percussion, situated on the right side of the abdomen, extending from just below and 2 inches to the right of the umbilicus up to the margin of the ninth costal cartilage, from which point resistance extended across the abdomen along the line of the transverse colon. The swelling appeared to be like a sausage in shape. A diagnosis of intussusception was arrived at, and under chloroform Mr. Roper made an incision in the middle line. On opening the peritoneum he found a red, inflamed, sausage-shaped tumour, which proved to be the gall-bladder greatly distended and elongated, and adherent on its posterior surface to the intestines. Excepting collapse of the large bowel on the distal side of the tumour, nothing abnormal was discovered in the intestines. The gall-bladder was very tense, and no stones could be found in it. It was stitched to the wound and drained. A number of gall-stones were removed seven weeks later, and the patient made a good recovery.

Mr. Lane's case, described under Phlegmonous Cholecystitis, is a good example of this form of obstruction from inflammation starting in the gall-bladder region, though in his case no gall-stones were discovered at the time of operation.

These cases will, as a rule, yield to general and medical treatment, and it will only occasionally be necessary, as in Mr. Roper's and Mr. Lane's cases, to resort to operation during the seizure if the symptoms are not subsiding, though subsequent surgical treatment may be required.

## CHAPTER VI

### TUMOURS OF THE GALL-BLADDER AND BILE-DUCTS

IF by tumours be understood new growths, then tumours of the gall-bladder and bile-ducts are not common ; but if we accept the usual interpretation of the term, and include all enlargements as tumours, we shall find them by no means rare.

The subject will be considered under the following classification, which appears to include all the chief varieties :

#### I. TUMOURS OF THE GALL-BLADDER.

- (A) Distension of the gall-bladder.
  - (a) Distension with bile.
  - (b) „ „ concretions.
  - (c) „ „ pus (empyema).
  - (d) „ „ mucus (hydrops).
  - (e) „ „ hydatid cysts.
- (B) Hypertrophy and thickening of walls of the gall-bladder forming a large, easily perceptible tumour.
- (C) New growths.
  - (a) Simple.
  - (b) Malignant.

#### II. TUMOURS OF THE BILE-DUCTS.

- (A) Distension.
- (B) New growths.

## I. TUMOURS OF THE GALL-BLADDER.

### Distension of the Gall-bladder.

A mere fulness of the gall-bladder does not necessarily form a tumour; hence in the absence of obstruction a gall-bladder may be larger than normal and full of bile, yet incapable of being felt through the abdominal wall.

A tumour is felt as soon as retention occurs under tension, when the cyst full of fluid often gives the sensation on palpation of a pyriform solid, it being so hard.

A tumour of the gall-bladder through distension with bile is not common, though it is sometimes described as an accompaniment of a gall-stone attack, where the concretion is impacted in the common duct; even in such a case it is usually a symptom of short duration, since, if the impaction be complete, the bile speedily becomes absorbed, and gives place to distension by mucus.

A perceptible tumour formed by distension with gall-stones is also rare, unless it happens that some have become impacted in the cystic duct, when a gradual enlargement from the retained mucus will follow. As many as 720 gall-stones were removed from the gall-bladder in Case 107, and yet that gall-bladder could not be felt as a distinct tumour. Occasionally a large single stone may form a hard, perceptible swelling below the liver, as in the following case.

CASE 221.—The patient, a woman, aged thirty, had suffered for four years from a constant pain in the right hypochondrium of a dull, aching character, considerably worse on exertion, and occasionally radiating into the right subscapular region. During the attacks she vomited, but never had a rigor, and was never jaundiced. On abdominal examination, a hard, globular, tender mass was felt below the right costal margin, which was freely movable from side to side, and moved with respiration.

*Operation, July 7, 1898.*—A large oval stone, which was the tumour felt before the operation, was extracted from the gall-bladder. It measured  $2\frac{1}{4}$  by  $1\frac{3}{8}$  inches, and weighed

1 ounce 30 grains. The gall-bladder was drained for four days, and the patient made a perfect recovery.

Fig. 43, a photograph of a specimen in the Hunterian Museum, is also an example.

Calcified gall-bladder, which is due to cholelithic catarrh, may lead to the formation of a hard, rounded, painless tumour; and this is evidently not uncommon, if we may judge of its frequency by specimens in the museums.

Specimens No. 2,808 and 2,808A (Fig. 44) in the Royal College of Surgeons Museum are good examples, as also are No. 1,402 in Guy's and No. 1,599 in the Middlesex Museums.

The specimen from the Middlesex Museum is interesting in that it was removed from a woman of nearly seventy, and contained bile and one concretion.

A specimen of my own is in the Leeds Pathological Museum; the history is as follows:

**CASE 375.—Choledochotomy and Cholecystectomy—Recovery.**—Mrs. W., aged fifty-seven, seen with Dr. M., of Bolton, for repeated attacks of biliary colic associated with jaundice of three weeks' standing and rapid loss of flesh.

*Operation, June 8, 1901*, when a gall-stone was found in the common duct, and one in a calcareous gall-bladder, the shape and size of a hen's egg. Choledochotomy and cholecystectomy were performed, and followed by a smooth recovery, the patient being quite well in September, 1901.

**Hydrops and dropsy of the gall-bladder** are terms used to denote distension of the gall-bladder by mucus. It may result from any obstruction in the cystic or common ducts, whether due to gall-stones, stricture, or growth in the ducts, or to cancer of the head of the pancreas, provided that the gall-bladder has not atrophied as the result of previous gall-stone irritation. It is due to the gradual accumulation of the natural secretion of the mucous lining, and may attain such a size as to be mistaken for an ovarian cyst, as in cases reported by Lawson Tait, Mayo, and Kocher, though it is uncommon to find the tumour of greater size than 15 to 20 ounces' capacity. In the St. Bartholomew's Museum is a specimen in which the lower end of an enormously dilated



PLATE XIX.



FIG. 43.—LARGE SINGLE CALCULUS FILLING  
THE GALL-BLADDER.  
(No. 2,819, Hunterian Museum.)

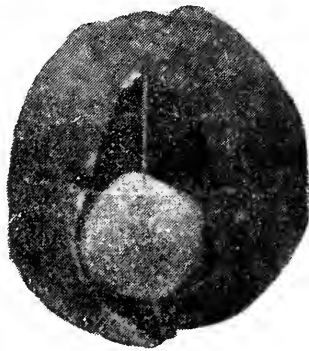


FIG. 44.—CALCIFICATION OF GALL-BLADDER.  
(No. 2,808A, Royal College of Surgeons Museum.)





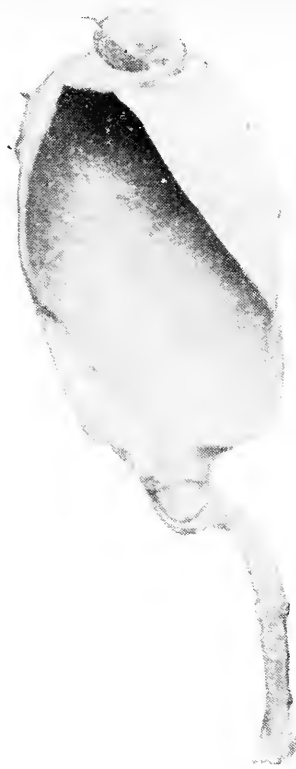


FIG. 45.—DISTENDED GALL-BLADDER AND POUCH AT FUNDUS CAUSED BY CALCULUS OBSTRUCTING CYSTIC DUCT.  
(No. 2,814, Royal College of Surgeons Museum.)



FIG. 46.—HYPERTROPHY AND DILATATION OF GALL-BLADDER, WITH POUCHES FORMED BY THE MUCOUS MEMBRANE BULGING BETWEEN THE MUSCULAR FASCICULI.  
(No. 2,804, Royal College of Surgeons Museum.)



FIG. 47.—CONTRACTED GALL-BLADDER, WITH HYPERTROPHY OF WALLS DUE TO GALL-STONE IRRITATION.  
(No. 2,807, Royal College of Surgeons Museum.)

gall-bladder had passed through the right femoral ring, forming the contents of the sac of a femoral hernia, and which was first discovered at the operation.

Specimen No. 1,416, Guy's Museum, shows a distended gall-bladder containing colourless mucus, and at the post-mortem no obstruction was found in the ducts. The patient died from pyæmia after acute necrosis of bone.

Specimen No. 1,587, Middlesex Museum, shows an enormously dilated gall-bladder, the result of impaction of a gall-stone at the neck of the gall-bladder.

Specimen No. 2,814, Royal College of Surgeons Museum, shows a large gall-bladder with a gall-stone impacted in the cystic duct (Fig. 45).

Reymond (*Revue de Chirurgie*, June, 1900) reports a case of movable kidney with hydronephrosis, due to compression of the pedicle of the kidney by a distended gall-bladder. Nephropexy was performed, and subsequently cholecystotomy, when a large quantity of purulent fluid and four gall-stones were removed from the gall-bladder. The patient made a good recovery.

In the Appendix will be found examples of distension of the gall-bladder due to the following conditions :

1. Calculus in the cystic duct.
2. Stricture of the cystic duct.
3. Obstruction of the common duct from growth, stricture, and calculus.
4. Chronic pancreatitis.
5. Cancer of ampulla of Vater.
6. Cancer of the head of the pancreas.
7. Movable kidney and kinking of the bile-duct.

**Empyema of Gall-bladder.**—If the obstruction be associated with inflammation, the contents of the gall-bladder may become purulent, and an empyema of the gall-bladder may result, the symptoms and complications of which have already been considered (see p 85).

**Hypertrophy of the gall-bladder** forming a large tumour is not infrequently seen as a result of cholelithiasis. Figs. 46 and 47 afford good examples; in both cases the walls of the

gall-bladder are much thickened, the cavity in one being almost obliterated and in the other dilated and pouched. The contents may be mucus or muco-pus, and gall-stones may or may not be present when the tumour is removed, though probably in every case biliary concretions have actually initiated the trouble by obstructing the outlet and producing cholecystitis.

On two occasions I have performed cholecystectomy (Cases 234 and 340) under the idea that the tumour was malignant, though an examination of the specimen subsequently has shown the true nature of the disease.

CASE 340.—Mrs. E. L., aged forty-two, seen at the Leeds General Infirmary on October 1, 1900. Had suffered from attacks of biliary colic for eighteen months. During the last three months the attacks had been very severe, and accompanied by transient jaundice. She had lost  $2\frac{1}{2}$  stones in weight.

*Operation, October 10, 1900.*—The gall-bladder was found adherent and full of calculi. Some friable tissue, probably growth, was found involving the wall of the gall-bladder and liver in the immediate neighbourhood. Several gall-stones were found in a cavity in the liver substance which was apparently due to the necrosis of malignant growth.

The liver was drawn out through the abdominal incision, and two pins passed through below the growth, one transfixing the cystic duct. A stout rubber ligature was passed round below the pins and tied tightly. The solid portion of liver, with the gall-bladder, was then amputated. The patient made a good recovery.

Report on the tissue removed says: Chronic inflammation, possibly tuberculous. No evidence of malignant disease.

Firm adhesions to the neighbouring organs, the result of local peritonitis, form a distinct feature of these tumours, and though their separation may be tedious, this should be done, and should be followed by cholecystectomy.

**Lipoma.**—As an extremely rare event, the gall-bladder may form an adipose tumour, as in a specimen from Guy's Museum, No. 1,403, the walls of the gall-bladder, infiltrated with fat, being  $\frac{1}{3}$  inch thick. It was removed from a man

of sixty-six suffering from kidney disease and cirrhosis of the liver.

**Hydatid of the Gall-bladder.**—Hydatid of the gall-bladder may occur primarily, as shown in the case related below, but it is probably more common for the disease to originate in the liver, and then to burst into the gall-bladder, producing symptoms resembling gall-stone seizures.

The following case is an example of this condition :

CASE 161.—H. M., aged forty-four, seen with Dr. Scatterty, Keighley. Patient had had a tumour of the liver for six years, and for a year had suffered from attacks resembling gall-stone seizures. Infective cholangitis and jaundice were present. It was thought that the condition was due to small cysts discharging into the bile-ducts.

*Operation, January 28, 1897.*—Hepatotomy with drainage of cyst. The patient made a good recovery, the jaundice disappearing, and no recurrence of the attacks of pain occurring.

The following interesting case was under the care of Mr. Jonathan Hutchinson, junr. :

A young woman, who had never been out of England, and who, so far as was known, had had nothing specially to do with dogs, developed symptoms of severe cholecystitis and obstructive jaundice. Her pain was as intense as that met with in colic due to gall-stones, and she had repeated rigors. The distended gall-bladder could be felt through the abdominal wall. At the operation a large number of hydatid cysts, mixed with pus and bile, were evacuated from the cavity of the gall-bladder. It was subsequently ascertained that the roof of the gall-bladder, about midway between its fundus and its neck, presented a round aperture leading into a hydatid cyst in the centre of the liver. Convalescence was very slow, as fragments of hydatid membrane continued to be discharged, and at one time pleurisy was suspected, but without effusion. She gradually gained in strength, and made ultimately a complete recovery. The case was under Mr. Roger Hutchinson and Mr. Jonathan Hutchinson, junr.

Dr. McGavin (*Lancet*, February 22, 1902) records the following case :

A woman, aged thirty-two, had noticed an abdominal tumour for three years. About an inch above the umbilicus, and slightly to the right of the middle line, was a hard, slightly lobulated, roundish tumour. It was freely movable, especially to the right. On percussion it was dull, and there was impaired resonance between it and the liver, which was not enlarged. It was not tender to ordinary manipulation. The abdomen was opened, and the tumour found to be the gall-bladder itself, adherent to the great omentum. Cholecystectomy was performed, the patient making a good recovery. The specimen, on examination, was found to be the gall-bladder, lined by a thick hydatid membrane, unstained by bile, the cavity of the cyst being occupied by numerous daughter cysts and gelatinous semi-translucent material.

After examining Dr. McGavin's specimen, Mr. Shattock (Pathological Society of London, October 15, 1901) was of opinion that the tumour was a pedunculated hydatid attached to the liver, and was not the gall-bladder. The specimen has been placed in the Hunterian Museum of the Royal College of Surgeons.

Bowman (*Lancet*, April 8, 1876) reported a case in which the patient died during aspiration of a hydatid cyst of the lung. The gall-bladder was found post-mortem to be distended by a single cyst of the size of a foetal head, containing one daughter cyst. There had been no jaundice and no complaint of pain at any time.

Knowsley Thornton (*Lancet*, April 4, 1891) reported a case in which the symptoms of acute biliary colic were followed by jaundice. Here the gall-bladder contained a number of hydatid cysts and much bile-stained fluid, and one other cyst was removed from the omentum.

Mr. Page, of Newcastle, described a case\* of hydatid of the gall-bladder in a man between fifty and sixty years of age who, until within five years of coming under Mr. Page's care in December, 1897, had been in good health. During that period he had suffered from occasional attacks of pain in the epigastric region, accompanied by vomiting; for eight months

\* *Lancet*, April 9, 1898.



the attacks had become more severe, and had occurred more frequently. About October he began to lose flesh, and the pain and vomiting were almost continuously present. On November 24 there was first found a tumour of some size, connected with the under surface of the liver, which was supposed to be a distended gall-bladder. On December 9, 1897, the abdomen was opened in the right semilunar line, and the gall-bladder exposed. Some 12 ounces of clear, colourless fluid were drawn off by aspiration, and a search made for a stone in the cystic duct; but none was found. The gall-bladder was incised and a collapsed hydatid cyst at once protruded. This was removed, but not in one piece. No bile escaped. The margin of the incision into the gall-bladder was then sutured to the skin, and the abdominal wound closed. For eleven days the temperature continued to be normal, and all went well—a good deal of clear fluid escaping from the gall-bladder quite unstained by bile. On the 23rd the temperature rose to 102° F., and there was an unpleasant smell about the dressings. On examining the sinus into the gall-bladder, its orifice was found to be plugged firmly by a piece of decomposed hydatid cyst, upon the removal of which a considerable quantity of bile escaped. From this time till the middle of February bile continued to flow, at first so copiously that it was necessary to change the saturated dressings twice, and sometimes three times daily. Ultimately the sinus closed, and the patient completely regained health and strength.

‘In this case the gall-bladder was occupied by a single hydatid cyst containing no daughter cysts. A portion of the cyst extending into the cystic duct had evidently not been removed at the time of operation. When this retained portion separated and became lodged in the sinus, bile flowed into and distended the gall-bladder, by this time considerably reduced in size, escaping through the sinus as soon as its plugged orifice was freed.’

**Actinomycosis of the gall-bladder** is probably extremely rare, the case described below, which came under my care, being the only one with which I am acquainted.

CASE 379.—Frank N., aged forty-seven, seen with Dr.

Dickey, Colne. For eighteen months the patient had been losing flesh, and had suffered from pain in the right hypochondrium. For three months the pain had been very acute, and he had had severe attacks daily. The gall-bladder was enlarged and tender, and there was some dilatation of the stomach.

*Operation, July 18, 1901.*—The gall-bladder was found to be filled with soft, putty-like débris. No gall-stones were found. The gall-bladder was cleared out with a scoop, and drained. The patient made a good recovery from the operation, and was well and at his work three months later.

An examination of the removed material showed the disease to be actinomycosis, in consequence of which a course of iodide of potassium was prescribed.

**Enlargement of the Gall-bladder.**—Enlargements of the gall-bladder may vary from a tumour just perceptible to the touch to one of such a size as almost to fill the abdomen, though one of greater size than a large pear is exceptional. The same tumour may also vary in size at different times, this variation being frequently found in gall-stone obstruction.

*Symptoms.*—The symptoms of tumour of the gall-bladder depend for the most part on the cause, and in consequence vary considerably, at times being slight and unimportant, at others both urgent and serious.

The gall-bladder, as a rule, enlarges downward and forward in a line which, drawn from the ninth or tenth costal cartilage, crosses the linea alba a little below the umbilicus, but the position of the tumour varies with the size of the liver. When that organ is of normal size, the neck of the gall-bladder is opposite the ninth costal cartilage, whereas when the liver is enlarged the gall-bladder will be pushed down, so that the neck of the tumour may be opposite to, or even below, the umbilicus. If uncomplicated, it will have a smooth, rounded, and pear-shaped outline, the larger end being below, quite free, and movable from side to side, the upper end being fixed and passing under the lower margin of the liver at the fissure of the gall-bladder.

A distinct sulcus between the liver and gall-bladder is nearly always perceptible to the touch, if the warmed flat hand be laid over the right side of the abdomen, and the patient be told to take a deep breath, when the tumour and the liver will descend together and pass under the fingers.

Bimanual palpation will frequently throw additional light on the case, the right hand being placed in front of the abdomen, and the left under the right loin, making gentle pressure forwards.

In other cases additional information may be obtained by placing the patient in the genu-pectoral position, and passing the right hand round the abdomen from behind, when a tumour of the gall-bladder will rest distinctly on it, and on deep inspiration the tumour can be felt to move just beneath the abdominal walls, the upper surface of the liver also being in this way capable of palpation.

The swelling is, as a rule, far too tense and hard for fluctuation to be elicited, though at times this sign may be obtained when the swelling is less tense.

In some of the larger swellings a thrill, almost like the hydatid fremitus, may be felt on gently flicking the tumour with the finger-nail. Percussion by no means always elicits dulness co-extensive with the tumour, especially if the surrounding intestines be distended; so that dulness on percussion is a very variable sign, and palpation will be found more reliable.

Inspection of the abdomen with the patient recumbent will at times show the tumour descending on respiration, but this sign is usually only to be observed in thin patients, and in cases uncomplicated by inflammation. When there is inflammation and matting of the adjoining viscera, a fixed swelling may be seen over the right hypochondrium, with dulness on percussion and marked tenderness.

Tenderness on palpation is a variable symptom, depending on the presence or absence of local peritonitis, it being as a rule absent in uncomplicated enlargements of the gall-bladder.

Jaundice may complicate tumours of the gall-bladder,

both being dependent on the same cause—obstruction of the common bile-duct. Although not absolutely pathognomonic of malignant disease, the combination should always raise a suspicion of cancer of the head of the pancreas or of the liver or bile-ducts, especially if it be associated with great loss of flesh and strength, and with absence of characteristic gall-stone pain.

We have observed, in a considerable number of cases, distension of the gall-bladder with jaundice to be associated with malignant disease, but much less often the combination of tumour, jaundice, and gall-stones. The explanation of this apparent anomaly is that the gall-bladder frequently becomes diminished in size and adherent, as the result of gall-stone irritation, so that when the common duct becomes blocked by a calculus, jaundice occurs without distension of the gall-bladder, which is unable to expand.

If, however, the common duct becomes obstructed by gall-stones before the gall-bladder has contracted and formed adhesions, there may be the combination of jaundice and tumour.

If the common duct be blocked by tumour, the gall-bladder, not having been subjected to irritation, and therefore not having become contracted, will at once distend.

Thus, in malignant disease of the head of the pancreas we find the usual combination of jaundice with tumour of the gall-bladder.

Gall-bladder tumours usually contain mucus, occasionally pus, rarely bile. In all cases when the cystic duct is obstructed, and inflammation has not followed, mucus alone is present, though when inflammation co-exists, pus or muco-pus may be found.

In obstruction of the common duct by gall-stones, the gall-bladder, though usually contracted, may be found distended by bile at first and mucus later; though, as a rule, the swelling subsides more or less rapidly and no tumour persists, the gall-bladder shrinking. When the obstruction becomes absolute, as in malignant diseases of the head of the pancreas, the tumour formed is persistent, and although

the block is in the common duct, bile soon ceases to reach the gall-bladder, and the tumour is always found to contain mucus. This occurs on account of the backward pressure preventing the excretion of bile, which, though formed by the liver cells, is immediately taken up by the lymphatics.

*Diagnosis.*—Tumours of the gall-bladder may have to be diagnosed from :

1. Movable right kidney.
2. Tumour of the right kidney, or of the suprarenal capsule.
3. Tumour of intestine or fæcal impaction.
4. Tumour of liver.
5. Pyloric tumour.
6. Abnormal projection of liver.

The diagnosis of enlargement of the gall-bladder from movable right kidney is, as a rule, easy in thin persons; but in those who are stout, or have tense or strong muscular abdominal walls, difficulties may and do arise, which can, however, usually be overcome by examination under an anæsthetic.

They resemble one another in that each forms a moderate-sized, distinctly-defined, rounded and movable tumour on the right side of the abdomen, which is found to descend on inspiration.

The previous history may throw light on the case, especially if there have been definite cholelithic attacks or the presence of jaundice.

By inspection of the abdomen, a gall-bladder tumour is often apparent, moving rhythmically with the respiratory movements when the patient is recumbent; but a floating kidney can rarely be so detected.

The general outline of the tumour as detected by palpation may afford valuable assistance; thus, in distension of the gall-bladder the tumour formed is pear-shaped, with the apex towards the fissure of the gall-bladder, and its long axis in a line from about the tip of the ninth costal cartilage downwards, forwards, and inwards towards a point a little below the umbilicus. In floating kidney, especially in patients

with lax abdominal walls, the tumour may be grasped and its characteristic shape made evident.

Should adhesive peritonitis accompany the gall-bladder condition, there will be tenderness and pain on pressure over the tumour, especially near its apex. These signs are rarely, if ever, present in floating kidney.

The gall-bladder tumour can easily be moved to a limited extent inwards and outwards by manipulation, but under no circumstance can it be depressed into the pelvis. On relieving it of pressure it tends to resume its old position under the liver.

Floating kidney has a generally wider movement, can at times be depressed into the pelvis, and when relieved of pressure tends to pass towards the right loin, especially when the patient is recumbent.

A valuable diagnostic sign is the sulcus often felt between the lower margin of the liver and the gall-bladder tumour; this can usually be felt when the warm flat hand is placed over the upper part of the swelling and the patient is asked to breathe deeply.

In the case of renal tumour, as well as in movable kidney, by distending the intestine with gas the kidney will be pressed back into the loin, but the gall-bladder will be pushed up towards the liver and made more prominent. The last test is usually also sufficient to enable a diagnosis to be made between a distended gall-bladder and a tumour of the right suprarenal body; but this is not always reliable, as in a case\* I saw with the late Dr. Kebbel, of Flaxton, the application of Ziemssen's test pushed the swelling upwards, and on performing abdominal section, a sarcoma of the suprarenal capsule was found and removed, the explanation being that the colon was fixed below the growth and pushed it up when the bowel was distended with gas.

In tumour of the intestine or of the pylorus, the associated stomach or bowel symptoms are usually sufficient to enable a diagnosis to be made, but when in doubt, distension of the stomach or bowel with gas will help to clear it up, or examination under an anæsthetic will afford assistance.

\* *British Medical Journal*, August 26, 1899.

Tumour of the liver itself, either cancer or hydatid disease, may be almost indistinguishable from one of the gall-bladder ; though the presence of nodules in the liver, with the history and other symptoms of malignant disease, will usually be sufficiently distinctive in cancer, while the less localized and more generally fluctuating swelling, together with the longer history and absence of pain or tenderness, will distinguish hydatid tumour.

It should not be forgotten that the right lobe of the liver may have an abnormal projection, either in the site of the gall-bladder or to the right of that position, which may at first be mistaken for an enlarged gall-bladder ; but the absence of symptoms, together with careful bimanual palpation, will usually enable a correct diagnosis to be made, and, as Professor Riedel has pointed out, the gall-bladder may frequently be felt apart from the swelling, or at the top of it

Puncture with an exploring syringe would, of course, give valuable information, but this should not be lightly undertaken, as it is not devoid of risk, death having occurred on more than one occasion as a direct result of this apparently slight operative procedure.

If it is decided to employ an exploring needle, the aspirator should always be used, in order that the tense cyst may be completely emptied, otherwise leakage from the puncture is almost certain to occur. In cases where the abdomen has been opened we have seen a puncture of the tumour by a small exploratory syringe to pour out fluid in a forcible stream, showing what would have occurred had the puncture been made through an unopened abdomen.

In case of doubt, especially where the symptoms demand interference, exploration of the tumour through a small abdominal incision can be undertaken with very little risk, and at the same time further treatment where called for can be carried out.

**Of the tumours dependent on new growth, cancer of the gall-bladder** is the most important, innocent growth, except of inflammatory origin, being extremely rare ; unless it be true, as Zenker (Musser's quotation) suggests, that an adenoma first develops in the gall-bladder and subsequently becomes

transformed into an adeno-carcinoma. Dr. Rolleston\* has reported a case in which this sequence apparently occurred in the bile-duct of a woman from whom a papilloma was removed, the growth being in immediate contact with a gall-stone. After some months she returned with a growth in the same region, presumably malignant.

**Cancer of the gall-bladder** is not nearly so uncommon as was once believed, but as a primary affection is somewhat rare. It is usually secondary to gall-stones, or to cancer of adjoining organs, and in the latter case is not amenable to surgical treatment.

Musser collected the reported cases,† and Dr. Rolleston has published two extremely interesting papers (to which we have been much indebted) on the subject, one in the *Medical Chronicle*‡ and the other in the *Clinical Journal*.§

The tumour may be of three varieties :

- (a) Columnar-celled carcinoma ;
- (b) Spheroidal-celled carcinoma ;
- (c) Squamous epithelioma.

The existence of squamous-celled epithelioma in the gall-bladder has been doubted ; but the appearances in the case described and figured below (Fig. 48) seem to be conclusive. Dr. Rolleston explains the appearances shown in such cases by saying, ‘ In transitional parts the epithelial cells may be so far modified as to appear flattened, and have then been described as squamous cells,’ and it is possible his explanation is the true one, but the question can scarcely be decided on the evidence at present available. The growth is said usually to begin at the fundus, where the irritation from gall-stones would be most felt ; but it may occur first at the neck of the gall-bladder, or it may be found as a uniform thickening of the walls of that viscus. In the last case there is often found in the centre of the mass a cavity containing gall-stones ; while where the neck of the gall-bladder is the primary seat, it is usual to find a gall-stone impacted just

\* *Medical Chronicle*, January, 1896.

† *Boston Medical and Surgical Journal*, December 15, 1889.

‡ *Medical Chronicle*, January, 1896.

§ *Clinical Journal*, April 7, 1897.



# PLATE XXI.

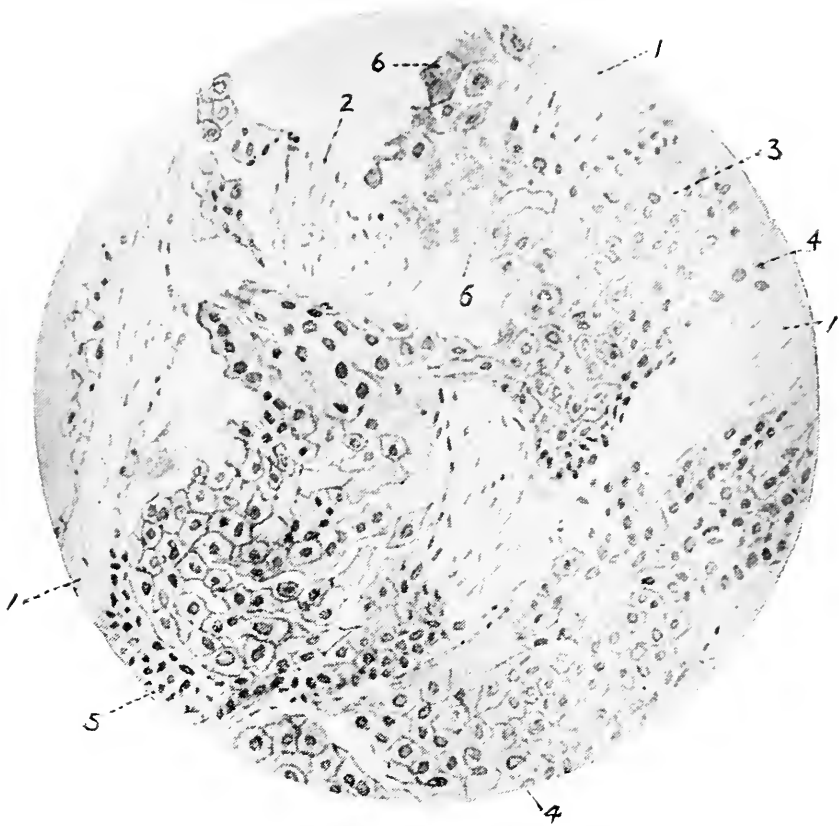


FIG. 48.—MICROSCOPIC SECTION OF THE NEW GROWTH.

(Hartnach Obj., No. 4, Oc. 3 =  $\times 120$ . Drawn by J. W. Haigh.)

- 1, 1, 1, Connective tissue of alveolar walls; 2, connective tissue nuclei;  
3, epithelial cells, somewhat squamous in appearance; 4, 4, nuclei of ditto;  
5, smaller, rapidly-growing cells of basement layer; 6, 6, degenerated  
epithelial cells, in which the nuclei have disappeared.



PLATE XXII.



FIG. 49.—CARCINOMA OF GALL-BLADDER.  
(No. 2,265, St. Bartholomew's Museum.)



FIG. 50.—CANCER OF GALL-BLADDER INVADING LIVER.  
(No. E. 308, Leeds Museum.)



beyond the disease, which would appear to have started as a result of the local irritation (Case 232).

Brault (quoted by Morin, *Thèse de Paris*, 1896) considers that squamous-celled epithelioma of the gall-bladder is secondary to a small primary growth in the skin which has passed unnoticed.

Deetz (*Virch. Archiv.*, Bd. clxiv., p. 381) reports four cases of stratified epithelial cancer of the gall-bladder; in two a primary growth was found, the one a cylindrical epithelial cancer of the rectum, the other an adeno-carcinoma of the common bile-duct. The gall-bladder growths showed in all the cases the typical structure of stratified epithelial cancer with cell-nests, and in three prickle cells were found. Deetz considers that the only possible explanation is the direct transformation of cylindrical into stratified epithelium under the influence of abnormal chronic irritation. This must be a rare occurrence, since in a careful examination of 300 gall-bladders he never found stratified epithelium, even in cases where gall-stones were present.

Bret (*Lyon Médicale*, September, 1898) reports a case of primary cancer of the gall-bladder in which the growth on microscopic examination showed in some places typical columns of squamous-celled epithelioma, some of the cells showing imbrication, and in others cylindrical cells, in some of which colloid changes were manifest.

The columnar-celled form may project into the gall-bladder, and fill it with a villous or papillomatous growth.

Specimen No. 2,265 in St. Bartholomew's Museum shows a soft carcinoma in the gall-bladder budding from the mucous membrane in a polypoid form (Fig. 49).

No. 2,266A, St. Bartholomew's, also shows an epitheliomatous papillary growth in the gall-bladder, and secondary cancerous growths in the liver.

No. E 308, Leeds Museum, shows a similar condition (Fig. 50).

No. 2,264, St. Bartholomew's, shows a gall-bladder converted into a mass of medullary cancer, in the centre of which are four faceted gall-stones. The pylorus is adherent. It was taken from a woman of fifty-nine who suffered from a

dilated stomach, but had no serious symptoms until a month before death. She was never jaundiced.

Extension of the growth is usually by continuity, the liver, as a rule, being first affected by its spread ; but the colon very frequently is the organ first attacked when the growth has originated at the fundus of the gall-bladder. Where the tumour arises at the neck, the pylorus, as might be expected from the anatomical relations, is not infrequently soon affected, and there may follow all the symptoms of cancer of the pylorus.

Where the gall-bladder becomes attached to any hollow viscus a fistula is apt to form (see p. 131).

The disease may spread along the mucous membrane and affect the ducts, and give rise to obstructive symptoms.

At times, though rarely, the peritoneum becomes infected, and there then rapidly follow ascites, and obstruction of the veins of the lower extremities.

The lymph glands at the hilum are usually affected, but systemic infection is rare.

The very frequent association of cancer of the gall-bladder with gall-stones is an undoubted fact, and in all probability there is a connection between the two diseases.

Zenker\* found gall-stones in 85 per cent. of cancers of the gall-bladder, and Musser, from an analysis of 100 cases, gives the proportion associated with gall-stones as 69 per cent., which may, however, be an underestimate, as it is well known that gall-stones may produce serious irritation, and then pass into the alimentary canal, so that their effects may remain, although the cause may not be discovered. Case 12 is an illustration of this, where, following on symptoms of gall-stones of several years' duration, came a distended gall-bladder, which at the operation was found to be due to cancer of the bile-duct, all the gall-stones having been passed.

Courvoisier found gall-stones present in 74 out of 84 cases of primary cancer of the gall-bladder ; Brodowski (Naunyn, p. 153) in 100 per cent. ; Jayle (Soc. Anat., 1893) in 23 out of 30 ; Bertrand in 14 out of 15 ; and Siegert in 95 per cent.

\* *Deutsch. Arch. für Klin. Med.*, 1899.

of primary, but only in 15 or 16 per cent. of secondary, carcinoma of the gall-bladder.

According to Schroeder, 14 per cent. of all cases of gall-stone patients suffer at some time from cancer of the biliary passages, and Naunyn is of opinion that half the cases of chronic jaundice diagnosed as cholelithiasis are complicated with cancer or are due to cancer alone, but the correctness of the observations is, in our opinion, somewhat doubtful. The frequent association of malignant disease is, however, of extreme importance, since operation in the presence of cancer and chronic jaundice is attended with more danger than in simple cases.

The two theories which have been current to explain the co-existence of gall-stone with cancer of the liver are: first, the 'irritation' theory, that gall-stones are formed first, and, by acting as foreign bodies, set up irritation, which leads to malignant growth; and, second, the 'concentration' theory, that gall-stones arise as a secondary result, from stagnation of bile in the ducts and infection of the bile passages, caused by their obstruction from malignant growth. It is, however, doubtful whether, apart from a catarrhal condition of the mucous membrane, gall-stones are formed. It should be remembered that the cholesterin in gall-stones is derived, in all probability, not from that present in the normal bile, but from the mucous membrane.

Mr. C. Beadles, in a paper\* before the Pathological Society of London, stated that out of 100 post-mortem examinations at the Cancer Hospital, 4 were cases of primary carcinoma of the liver, and all had calculi in the gall-bladder; 36 had secondary carcinomatous growths in the liver, but there were no gall-stones present in any of them. Of 9 cases of primary carcinoma of the liver at Colney Hatch, 5 were males and 4 females, and gall-stones were present in 7, being absent in 1 male and 1 female. These facts support the theory of irritation, as does also the fact that the disease occurs much more frequently in women than in men, and in much the same relative proportion as gall-stones. Musser's cases

\* *Lancet*, March 9, 1895.

included 75 females and 23 males; while Siegert found that of 93 cases 79 were in females.

*Symptoms and Signs of Cancer.*—If the growth be primary, there will be the history of a more or less rapidly growing tumour developing under the right costal margin, accompanied at first by a sense of discomfort, shortly changing to pain, which is often worse at night, and which, though at first localized to the right hypochondrium and epigastrium, usually before great advance has been made extends round the side to the right infrascapular region. When the enlargement is first noticed, it is felt as an egg-shaped swelling beneath the liver, descending on inspiration. The tumour is hard to the touch, and very slightly or not at all tender to pressure. At a later stage it becomes more fixed and more diffused, and nodules may develop and be felt on its superficial surface. As the growth extends, it invades the liver, and sometimes the duodenum, colon, and stomach. Dissemination is rare. When it occurs, nodules may be found in the liver, and generally over the peritoneum. In such cases ascites develops. The lymph glands in the hilum of the liver usually become affected.

According to the invasion or not of the hepatic or common bile-ducts, so will be the presence or absence of marked jaundice; but in nearly half of the cases some degree of icterus will be found as the disease advances, owing to the presence of catarrh of the bile-ducts.

Interference with the action of the bowels, even to partial or complete obstruction, at times occurs. General failure of health, continued wasting, with loss of strength, ascites, and marked cachexia, characterize the later stages.

Perforation may occur and hasten the end by the onset of general peritonitis. If gall-stones be present, there will be the usual antecedent history of cholelithiasis. Where gall-stones with jaundice complicate cancer of the gall-bladder, exacerbations of pain will usually be accompanied by rigors and fever, 'ague-like attacks' with an intensification of the icterus, and in such cases petechiæ in the skin with hæmorrhage from the nose and rectum generally supervene.

*Diagnosis.*—Cancer of the gall-bladder may usually be



diagnosed by the progressive character of the disease, and by the presence of the characteristic hard tumour; but it is by no means always easy to diagnose cancer from a tumour formed by matted intestines, due to local peritonitis in the neighbourhood of the gall-bladder.

In a doubtful case of this kind, in a woman of fifty, under my care in the Leeds Infirmary, when the abdomen was opened there was found what appeared to be a malignant tumour of the gall-bladder, which was punctured in several places with an exploring syringe. Finding it firm and hard, it was concluded to be malignant, and, as it was too extensive for removal, the abdomen was closed, since it was thought nothing more could be done. The patient, however, forthwith recovered, and is now well, with no remnant of her tumour. It is, of course, impossible to say that this was not cancer, but in all probability it was an inflammatory swelling associated with gall-stones (Case 46).

In another case of tumour, where there was a suspicion of malignancy, an abscess of the liver containing thirty gall-stones was opened, and this gave marked relief, though only for a time, as death supervened four months later, when malignant disease was found. When in doubt, exploration is probably the best method of settling the question, as at the same time treatment may be carried out, as in Cases 56 and 57.

That cancer of the right suprarenal body may afford a difficulty in diagnosis is shown by the case referred to in the chapter on simple tumours of the gall-bladder. The same difficulty applies to cancer of the pylorus, which, however, is accompanied for the most part by characteristic stomach symptoms.

*Treatment.*—The alleviation of symptoms, especially of pain by sedatives, is usually all that can be done, except in those rare cases where the disease is limited to the gall-bladder, when cholecystectomy may be performed.

For instance, specimen No. 2,265, Bartholomew's, is taken from a case in which the whole disease could have thus been removed, if it could have been diagnosed (Fig. 49).

In a limited number of cases in which the liver is affected

by direct extension from the gall-bladder, it may appear feasible to remove the whole disease. In such, it is probably right that the patient should get what chance there is of complete cure, though in all probability, as might be expected, this is but slight. As illustrating the kind of cases suitable for such treatment and the nature of the procedure which may be necessary, the following notes of cases may be useful :

CASE 127).—The patient, a woman of fifty-four, gave the

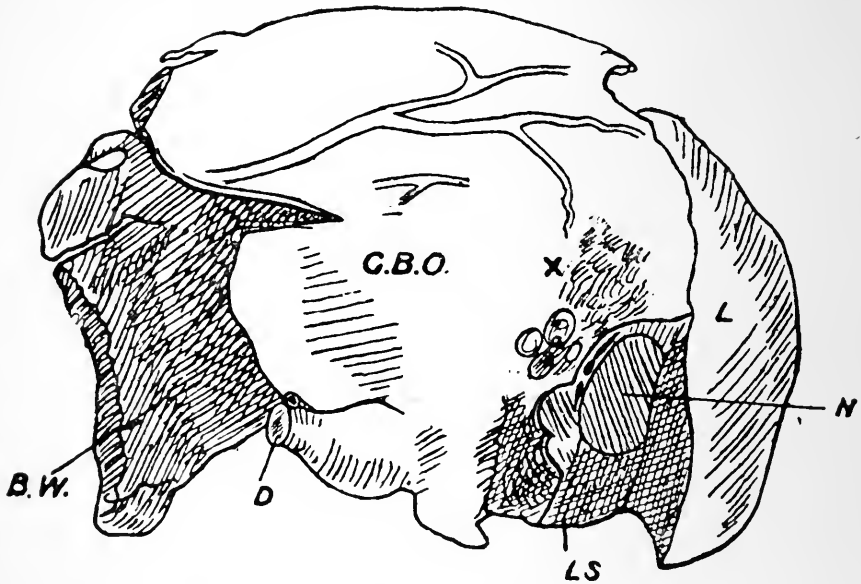


FIG. 51.—EXCISION OF A PORTION OF LIVER FOR TUMOUR. (REDUCED ONE-THIRD.)

G.B.O., Outer surface of gall-bladder ; near  $\times$  the growth is infiltrating the wall, shown in shaded portion ; B.W., thickened and infiltrated wall of gall-bladder, laid open ; L, liver ; LS, liver laid open to show—N, secondary malignant nodule in liver ; D, cystic duct. (*Trans. Roy. Med. and Chir. Soc.*, vol. lxxix.)

history of having had an enlarged gall-bladder for twelve years, which had given no trouble until three years before, from which time she had had gall-stone attacks. For four months she had been failing in health, and when seen the gall-bladder reached the right groin, and the right lobe of the liver the level of the umbilicus.

She was operated on on November 23, 1895, and on opening the gall-bladder the walls were found infiltrated with growth and the contents putty-like in consistence. The entrance to the cystic duct was occluded by a growth the

size of a walnut, and beyond this a gall-stone could be felt in the cystic duct. As there was a nodule of growth on the under surface of the liver close to the one in the neck of the gall-bladder, the whole mass was pulled forward and encircled with an elastic ligature, which was passed below the gall-stone so as to get well beyond the growths, retraction being prevented by two knitting-needles pushed through the projecting liver.

The projecting portion was then cut away; it included liver, gall-bladder, and part of the cystic duct, and weighed half a pound. Recovery was uninterrupted, and the temperature never reached 100° F. The growth, on examination by Mr. J. W. Haigh, was reported to be epithelioma. The case is fully reported in the seventy-ninth volume of the *Trans. Roy. Med. and Chir. Soc.* (Figs. 48 and 51).

CASE 201.—Mrs. H., aged fifty-two, gave a history of repeated severe attacks of pain in right hypochondriac region during twelve months, sometimes followed by jaundice. Preceding this there had been attacks of ‘spasms’ for some considerable time. A month before coming under treatment a swelling was noticed under the right costal margin. The patient had been losing weight and strength for several months, and was suffering from slight jaundice, which became intensified after each attack of pain, these seizures being followed by a feeling of chilliness with some fever. It was quite easy to make out an enlargement of the right lobe of the liver with a distended gall-bladder on its inner side. The abdomen was opened through the right semilunar line on November 27, 1897, and the gall-bladder was found enormously distended with putty-like material, which had to be removed by a scoop. The gall-bladder also contained four gall-stones. After numerous adhesions had been detached, there was felt an enlargement of the cystic duct, and below this an impacted gall-stone. Closely adjoining the gall-bladder a nodule of cancer was seen in the liver, which was also infiltrated opposite the growth in the cystic duct. The right border of the liver, which projected well below the ribs, and the gall-bladder and cystic duct, were now dragged forward, and a knitting-needle was thrust through the liver

and through the cystic duct below the disease, the whole being then encircled by an elastic tourniquet, which was tied and cut off short. The abdomen was then wiped dry, and the rest of the wound closed. The portion of liver, gall-bladder, and cystic duct beyond the ligature were then cut away, and apparently the whole of the disease was removed, as no nodules could be seen on any other part of the liver. The patient made a somewhat tardy recovery, from the persistence of the ague-like attacks which had been associated with the infective cholangitis present before operation.

The needle and tourniquet separated in a fortnight, and after that there was free discharge of bile for a time, giving great relief, and leading to the cessation of the ague-like seizures. The patient regained her flesh and strength, and had a period of good health until March, 1898, when a small nodule was noticed in the skin below the umbilicus, together with some swelling in the inguinal glands. In April there was a little ascites, and from this time her health rapidly failed, and she died from exhaustion in July, 1898. The portion of liver removed weighed 7 ounces, and then did not include the large amount of soft material removed from the gall-bladder. Under the microscope the growth proved to be carcinoma.

CASE 208).—Mrs. B., aged fifty-two, was admitted to the Leeds Infirmary in February, 1899, complaining of slight attacks of abdominal pain beginning in the previous September, and being specially severe in December. There had been very rapid loss of flesh, and by the time of her arrival at the hospital she was extremely ill. Icterus was slight, but there was a large, irregular, hard, and fixed tumour beneath the right costal margin, manifest to sight and tender on pressure. At the operation the gall-bladder and cystic duct were found filled with pus, epithelial débris, and gall-stones. The walls of the gall-bladder were infiltrated with growth, which extended into the adjoining part of the liver. The omentum, pylorus, hepatic flexure of the colon, and duodenum were all adherent, probably by cancerous infiltration; but, when they had been separated, it was deemed wise to complete the operation, as in the two previous cases,

by means of elastic ligature and external treatment of the pedicle. The patient was put back to bed in good condition, and seemed as if she would do well, but in the night she rapidly lost strength, and despite transfusion, injection of strychnine, and the use of other means, she died from shock.

Examination of the parts after death showed that the whole of the disease in the gall-bladder and liver had been removed.

CASE 273.—Mr. A. B., aged forty-six, had suffered from attacks of cholelithic colic for five years before coming under observation toward the end of 1897. At that time it was considered that there was a gall-stone in the common duct, and he was advised to submit himself to operation; but, acting on other medical advice, he decided not to do so. By the middle of 1899 he had lost 4 stones in weight, and was extremely weak. Jaundice was present, and there was evidence of infective cholangitis.

At the operation on June 26, 1899, there were found a large number of gall-stones in the common duct, and a tumour of the liver just at the point of attachment of the fundus of the gall-bladder. The mass, which was hard and irregular, was excised partly by the use of the knife and in part with scissors. The bleeding, which was not very severe, was controlled by pressure; only one vessel, an artery, requiring to be ligatured. A sponge was packed into the cavity left, while the gall-stones in the common duct were crushed, and cholecystenterostomy was performed by means of a Murphy's button, the remains of the gall-bladder just beyond the cystic duct being anastomosed to the duodenum. The wound in the liver, which measured about 4 inches across, was as far as possible brought together by catgut stitches placed deeply by means of an ordinary round, curved needle, and tied slowly, the remaining part of the cut surface of the liver being packed with iodoform gauze. On the second day a considerable amount of bile escaped along the gauze, and this continued to discharge for ten days, but in gradually diminishing quantity. After this time only serum escaped. The first packing was removed on the fourth day, and thereafter the wound was dressed twice daily for ten

days, and once a day from the end of the fortnight till it healed. Sixty-two gall-stones were passed per rectum on the tenth and eleventh day without any pain. The Murphy button came away on the twenty-third day. The patient left the nursing home five weeks from the date of the operation, and has since been very well. On August 29 he reported that he had gained a stone in weight since the operation. A microscopic examination showed the tumour to be a spheroidal-celled carcinoma. The after-history of the patient is most interesting, in that he is in perfect health at this date, nearly five years after operation.

CASE 367.—E. H., aged thirty-seven; seen at the Leeds General Infirmary. History of attacks of biliary colic for five years. Lately the attacks had been followed by jaundice. No loss of weight. A hard, rounded tumour felt in the region of the gall-bladder.

*Operation, April 12, 1901.*—The gall-bladder was enlarged, containing a dozen gall-stones and muco-purulent fluid. After removing the fluid and stones, the whole of the gall-bladder was found to be infiltrated with malignant disease. The growth was extending into the surrounding liver substance.

Three stout pins were passed through the substance of the liver, about  $1\frac{1}{2}$  inches beyond the growth, and a stout rubber ligature was tied tightly around the liver substance. The protruding portion, consisting of the gall-bladder and adjacent liver tissue, was then amputated, and the rest of the wound closed. The patient made a good recovery, and left the hospital on May 14.

CASE 330.—Mrs. S., aged sixty-three. History of pain and tumour associated with jaundice. Great loss of flesh and strength.

*Operation, August 10, 1900.*—Mass of growth discovered in liver, gall-bladder, and pylorus. Cholecystectomy, pylorectomy, and partial hepatectomy performed. Good recovery. Patient well and in good health June, 1903.

Microscopic examination showed the growth to be a carcinoma.\*

\* Case reported *in extenso* in *British Medical Journal*, April 13, 1901.

Other cases will be found reported in the Appendix (Nos. 340, 344, 485, and 528).

Moynihan (*British Medical Journal*, November 8, 1902) reports the following case of primary carcinoma of the gall-bladder:

Mrs. A., aged sixty. Two years ago the patient had an attack of hepatic colic, followed by jaundice. No stone was found. Six months ago a second attack, and a fortnight ago a third attack. In each attack the pain has been acute, sickening, and of several hours' duration, and after each jaundice has appeared. After the last attack a tumour was noticed in the right hypochondrium. It seemed about the size of a billiard ball, was not in the least degree tender, and moved very freely in all directions, as though only held by a stalk to the liver. There was neither jaundice nor ascites. A diagnosis of stone impacted in the cystic duct, with consecutive dilatation of the gall-bladder, was made, though the entire absence of tenderness was against this.

The abdomen was opened through the right rectus muscle, and the gall-bladder exposed. It was found densely hard, adherent to the omentum by moderately firm adhesions, but not bound to the liver. An incision in it showed that the enlargement of it was due to a great thickening of its walls, the lumen being small and having a capacity of barely more than a drachm. The omental adhesions were separated and the gall-bladder freed down to the cystic duct. The bladder and cystic duct were removed by cutting through the latter close to its junction with the common duct after a ligature had been applied round it. The peritoneum over the cut end was stitched with a continuous catgut suture, and the abdomen closed without drainage. The cavity of the gall-bladder was barely as large as a thimble; it contained a dirty grayish-black fluid. No stones were present, either in the gall-bladder or the cystic duct. A careful search of the hepatic and common ducts was made, but no stone was found. The wound healed by first intention, except at one stitch opening, from which about 10 to 20 drops of pus were expressed about three weeks after the operation. The

patient went home well in the fourth week, and her health has been well maintained since.

As in these cases, so in most, the question of operation will usually have to be faced, since the possibility of the trouble being dependent entirely on inflammation, the result of gall-stone irritation, and not on new growth, cannot always be pre-determined. Indeed, even after the abdomen has been opened it is not always easy to be sure of the exact condition of affairs until adhesions have been broken down. It is not very uncommon to find a gall-bladder containing pus and gall-stones in the centre of a mass of omentum and adherent viscera so hard as very closely to simulate new growth. In such cases, of course, all that is necessary in order to effect a cure is to remove the stones and drain the gall-bladder.

Whether it is worth trying thus to remove a localized cancer of the liver and gall-bladder is a question which can only be solved by more extended experience; but we are inclined to think that in the cases reported above, even when recurrence took place, the respite gained to the patient more than counterbalanced the danger of the operation. In similar cases, where no attempt at radical treatment was made, the course of events does not seem to have been nearly so satisfactory, for the disease steadily progressed to a fatal termination, and the patients had not even the satisfaction of a respite, or the hope of recovery engendered by the knowledge that the malignant disease had been removed.

**Sarcoma of the gall-bladder** is much less common than carcinoma, but it is occasionally found. Musser (*Boston Medical and Surgical Journal*, December 15, 1889) has collected three cases, and Rolleston (*Clinical Journal*, April 7, 1897) has reported another, which on examination was found to be a case of spindle-celled sarcoma. In the Hunterian Museum, Specimen No. 2,809 shows a melanotic sarcoma of the gall-bladder.

**Simple growths in the gall-bladder** are as a rule not of great clinical importance, except as precursors of malignant disease. The following specimens have been found in the museums :

No. 2,812, Royal College of Surgeons, shows villi and







FIG. 52.—PAPILLOMATA OF THE GALL-BLADDER.  
(No. 1,404, Guy's Museum.)

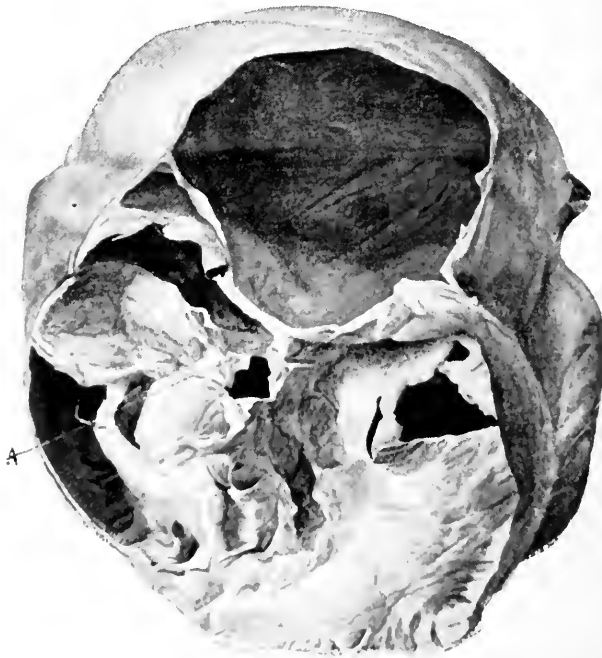


FIG. 53.—GROWTH OF GALL-BLADDER; CUT SURFACE OF BASE.  
Rather more than half size.

papillæ on the mucous surface of the gall-bladder associated with gall-stones.

No. 1,404, Guy's Museum, shows papillomata in the gall-bladder from a woman of fifty-nine who died of phthisis. They are sessile towards the fundus, and pedunculated towards the neck of the bladder (Fig. 52).

In the Museum of the Western Infirmary, Glasgow, is a beautiful specimen of adenoma of the fundus of the gall-bladder, which has been described and figured by Dr. L. R. Sutherland.\*

No. 1,405, Guy's Museum, shows a gall-bladder in which the mucous membrane is covered with warty growths.

**Multilocular Cystic Tumour of Gall-bladder.**—The following case, reported by Mr. Stanmore Bishop in the *Lancet* for July 13, 1901, is of great interest, and so far as I know is unique.

The patient was a woman, aged forty-two, florid-looking, fairly stout, and in good condition. Previously to the last two years she used to have almost weekly bilious attacks, which were never very severe, were attended by transient jaundice, and had since that time entirely disappeared. The last attack of jaundice was eight years ago. Eighteen months since she began to be conscious of a dull sickly pain, associated with a feeling of weight, not in the epigastrium or right hypochondrium, but in the left lower quadrant of the abdomen and over the sacrum. The pelvis was free. Below the liver, moving with it and with respiration, was a large rounded tumour, the dulness of which on percussion being continuous with that of the hepatic region. There had been no urinary symptoms. There was no pain or discomfort in the right shoulder, and there was no tenderness on manipulation. The bowels acted regularly, and the stools were normal in colour.

On opening the abdomen parallel and internal to the right linea semilunaris, the gall-bladder presented. It formed a tumour of the size of a child's head, evidently multilocularly cystic, the contents of the cyst showing a bluish colour through the thin walls. There were no adhesions. The

\* *Glasgow Medical Journal*, September, 1898.

tumour was packed around with sponges, and the cyst nearest to the surface was tapped. Mucus tinged with bile escaped through the cannula, but the swelling was not perceptibly decreased. A second and deeper cyst was tapped through the same orifice, with the same result, and it became evident that the main bulk was composed of comparatively small cysts, having no intercommunication. The opening in the abdominal wall was then enlarged, and the entire mass was turned out of the cavity. It sprung from the under surface of the liver, having for a pedicle apparently the cystic duct, which was greatly enlarged by the growth of the tumour downwards into it. As this was too large to admit the passage of a single constricting ligature, and as it appeared probable that any attempt at transfixing with ligature in segments might result in leakage of its contents into the general peritoneal cavity, its walls were carefully sutured all round to the parietal peritoneum, and that portion of the mass above this line was cut away. A few vessels in the walls of the gall-bladder required ligature, but the bleeding was comparatively trifling. The wound was then closed around it as far as possible. The remaining base of the tumour was dressed with iodoform gauze, and the rest of the skin wound was sealed with celloidin.

Fig. 53 shows the growth from the cut surface. Examination of the tumour showed that it was the gall-bladder itself, the cavity of which was divided up by dissepiments into many separate spaces. These, as shown in the illustration, have been opened in order that the cavities might be filled with cotton-wool, so that in setting it might retain its original shape; but originally all the cavities were distinct, and had no connection with one another. They contained mucoid fluid stained with bile. No calculi were present, and there were no hydatids.

The after-course of the case threw some little light upon the mode of origin. The stump left in the abdominal wall, composed of some part of the tumour, and the walls of the cystic duct, gradually contracted. The actual cautery was applied twice to the centre, and, as the contraction went on, bile escaped from the lower quadrant of the circle, showing

that the tumour was not equally connected all round its innermost extremity. It would appear that it must have started from the upper wall of the bladder or duct, and whilst in the process of growth it had blended with the lower wall and fundus of the gall-bladder; union had not been so complete in the duct itself. Microscopical sections of the septa and walls showed dilated glandular tubes of all degrees. Even the largest cyst-walls were lined with cylindrical epithelium. There had apparently been hypertrophy of the mucous lining of the wall, with immense development and distension of the glandular layer, but what caused such hypertrophy was not so clear. Was this an extreme stage of a papillomatous degeneration, or was it a new formation? That it was not a malignant growth seems evident by the regular arrangement of the component tissues and the absence of any confusion between the lining epithelium and the wall upon which they rest. No sarcomatous cells could be seen. Moreover, with the exception of the growth and some slight temporary attacks of jaundice, the patient was in perfect health. She had not lost flesh and was of a clear, healthy complexion at the time of operation, nor has she lost ground since. Bile, which is perfectly healthy, still escapes at times from the site of operation, and probably a cholecystenterostomy will be required, but otherwise she is perfectly well.

## II. TUMOURS OF THE BILE-DUCTS.

**Cystic Tumours.**—Tumours of the bile-ducts, *per se*, only occasionally form a projection so large as to be distinguished through the abdominal walls. A tumour is, however, in some cases, present sooner or later on account of the obstruction in the ducts and secondary distension of the gall-bladder. The common duct has been found dilated to such a size as to form a cystic tumour, presenting all the characteristics of a distended gall-bladder, the gall-bladder itself being atrophied.

Terrier describes four cases in which an external fistulous

opening was established in the common bile-duct. In three of these the duct was much distended, and formed a distinct abdominal tumour. The first case was one in which median laparotomy was performed for the removal of a swelling diagnosed as a cyst of the pancreas. The nature of this swelling having been revealed by the discharge of bile after puncture, a small portion of the wall of the cyst was excised, and the edges of this opening were attached to the external wound. The biliary fistula thus formed bled freely for some days after the operation, and subsequently suppurated. The patient died from anæmia and exhaustion on the twenty-ninth day.

In the second case, the much-distended duct, which had been regarded as a hydatid cyst of the liver, was exposed by laparotomy, incised, and attached to the wound in the abdominal wall. The patient died from collapse on the eighth day.

In the third case, the dilated duct was opened and stitched to the external wound, under the supposition that the tumour was a distended gall-bladder.

In the fourth case, it is not clearly stated whether the duct was distended or not, though it probably was. In this instance the hepatic portion of the divided duct was fixed to the surface of the abdominal wall after removal of the gall-bladder, the cystic duct, and a small portion of the liver for cancer. The patient did well for some time after the operation, but died six weeks later from exhaustion.

In his comments on these records, Terrier points out that in two of these cases the distension of the bile-duct, though clearly due to obstruction, was not associated with lithiasis. In the third case the duct was found to be completely obstructed at its intestinal orifice by a small calculus. In each instance of distended bile-duct the gall-bladder was much shrunken, and its walls were sclerosed and surrounded by cicatricial tissue.

In the abstract of cases given below there will be found two cases of this kind. In one the operation of choledochostomy was performed after cholelithotomy had been done, the patient making an excellent recovery; in the other chole-

dochoenterostomy, after cholecystectomy, the patient also doing well. Both patients are now in good health. (Cases 150 and 121.)

In June of this year (1903) I saw another case with Dr. Griffiths, of Swansea, where there were two swellings, one of which was diagnosed as distended gall-bladder and the other, internal to the gall-bladder, as a pancreatic cyst; both were apparently dependent on chronic pancreatitis, and were drained separately. The sequel appeared to prove that the apparent pancreatic cyst was in reality an enormously dilated common bile-duct, as after operation from 20 to 30 ounces of bile drained from it daily, whereas only clear mucus came from the gall-bladder. The pancreatic fluid came away with the bile; the nutrition of the patient could not be maintained until Benger's liquor pancreatici was given after each meal. Choledochenterostomy was subsequently performed. See Cases 511 and 526. The patient is now well.

The first patient was a man of twenty-five, who had suffered severely from gall-stone symptoms associated with a tumour, supposed to be a dilated gall-bladder. The gall-bladder, however, was found to be small, and situated external to the cystic tumour, which proved to be a dilated cystic and common duct, at the lower end of which was a gall-stone the size of a pigeon's egg, which broke into fragments as the duct was about to be incised for its removal. The fragments were removed and the dilated duct was opened and stitched to the aponeurosis in the same manner as one fixes the gall-bladder in cholecystotomy. (Case 150.)

The second case was a woman of fifty-five, from whom a very thick gall-bladder, which had the appearance of malignant disease, was removed; the cystic duct was greatly dilated, and formed part of the tumour, and there was no difficulty in introducing a Murphy's button and connecting it to the intestine. (Case 121.)

Although hitherto the results of choledochostomy have not always been favourable, probably in consequence of the fact that extreme distension of the bile-duct is often accompanied by infection of the biliary passages, it would be well to reserve our opinion as to the prospects of the operation

until we have more experience of it. Very little information can as yet be obtained on this subject, cases of extreme distension of the common bile-duct being very rare, and those in which surgery has intervened still more exceptional.

An interesting case is reported by Mr. W. P. Swain,\* in which he connected a dilated bile-duct to the jejunum by a Murphy's button. The size of the tumour, which occurred in a girl of seventeen, and which was associated with gall-stones, may be gathered from the fact of over 7 pints of fluid having been withdrawn from it at the time of operation. Three months after, the patient was progressing satisfactorily, except for an occasional rise of temperature, and for the fact that the button had not been passed.

Dr. Russell† describes a case in a boy, aged eight years, whose illness began with an attack of pain in the right side of the abdomen, and some fever. Jaundice appeared on the second day, and on the next there was first noticed a tumour. Associated with the jaundice there were the usual constipation, clay-coloured, offensive stools, and bile-pigment in the urine. By the fifth day there was a large tumour continuous with the liver, filling the right lumbar region, extending below the anterior superior spine, and reaching almost to the middle line. The tumour was elastic, dull to percussion, and somewhat tender, and simulated closely a hydatid cyst of the liver, for which it was mistaken. In the right semilunar line, just below the costal margin, was a smaller rounded tumour which it was thought might be due to a distended gall-bladder. As it was believed that the child was suffering from catarrhal jaundice in addition to hydatid cyst of the liver, he was kept in bed for sixteen days. During this period no bile passed through the common duct, and the icterus became more profound. At the end of this time he began to suffer from severe gall-stone colic without vomiting. At the operation the smaller tumour was found to be due to a distended gall-bladder full of colourless mucus; the larger was a retro-peritoneal cyst, from which, on aspiration, came clear fluid,

\* *Lancet*, March 23, 1895.

† *Annals of Surgery*, December, 1897.



and on incision some black, 'cinder-like' material (bilirubin). After operation, bile came from the cyst, which was stitched to the abdominal parietes. Death took place on the fifth day after operation from hæmorrhage. At the post-mortem examination the retroperitoneal tumour was found to be formed by an immensely dilated common duct, the orifice of which was small and valvular. Dr. Russell was inclined to believe that this condition was congenital, and of the same nature as one form of congenital hydronephrosis. So long as the mucous membrane was normal at the orifice, a certain amount of bile had been able to pass into the intestine, but immediately the catarrhal condition was set up this ceased to be possible. As a consequence the duct became further dilated, and so pressed on the valvular termination of the duct as to quite occlude the orifice.

Dr. Henry Ashby describes another case\* in a girl, aged seven years, who had been ill for two and a half years with jaundice, progressive emaciation, and, latterly, distension of the abdomen and œdema of the feet. After 50 ounces of ascitic fluid had been removed from the abdomen, a large cyst was found occupying mainly the right side of the abdomen, and continuous apparently with the liver. On aspiration, 16 pints of dark-green mucus were removed; at varying intervals during the following three months the cyst was tapped on ten occasions, from 8 to 10 pints of bile-stained fluid being removed each time. Under this treatment she so improved that it was considered advisable to drain the cyst. This was done, and the drainage was continued for two months, during which time the whole of the bile escaped through the tube inserted into the cyst after it had been stitched to the abdominal wall. As a result of an attempt to connect the cyst with the bowel, peritonitis was set up, and the patient succumbed. At the autopsy the cyst was found to be firmly attached to the under surface of the liver, and seemed to be formed by enormous distension of the common and cystic ducts. The hepatic duct opened into the cavity, but there was no communication between it and the duodenum.

\* *Medical Chronicle*, October, 1898.

Specimen No. 1,419, Guy's Museum, shows a dilatation of the common bile-duct. There is a thick-walled cyst 6 inches across, representing the common bile-duct; the portion of duct below this is less than the normal calibre, and has a valvular fold, which completely obstructs the lumen. The tumour was aspirated twice,  $3\frac{1}{2}$  pints of bile being withdrawn on each occasion without relief. Then choledochostomy was performed, and death ensued two days after (Fig. 54).

Dr. Arnison had a case under his care in 1891, where he operated on what was apparently a pancreatic cyst, which he drained. The patient was extremely ill at the time, and only lived a few days. At the autopsy the operation was found to have been a choledochostomy, and the tumour to have been a dilated common bile-duct.

In the Hunterian Museum is a large tumour (Fig. 55) of the liver constituted by dilated hepatic ducts, which form a series of cysts within the substance of the liver itself. There was no obstruction in the main bile channel.

**Solid tumours of the bile-ducts** may be simple or malignant.

*Simple tumour* is so rare that the following case (No. 234) is worth mentioning more fully :

During the twelve months before coming under my observation the patient, a woman, aged forty, had had repeated attacks of what appeared to be appendicitis. Each attack began by acute pain in the right iliac region, associated with fever and vomiting, and followed by the appearance of a tender swelling in the usual situation of the appendix, and the ordinary symptoms and signs of a localized peritonitis in that region. At no time were there any symptoms to suggest cholelithiasis.

The patient was seen only once, after one of these seizures had subsided, and the diagnosis of relapsing appendicitis, which had been made by her ordinary medical attendant, was confirmed.

At the operation the abdomen was opened over the cæcum, and the viscera in the neighbourhood were found all matted together. In the midst of these adhesions was found the gall-bladder, situated at the extremity of a Riedel's lobe, and containing muco-pus and several gall-stones. After these

PLATE XXIV.



FIG. 54.—DILATED COMMON BILE-DUCT FORMING A THICK-WALLED CYST  
SIX INCHES IN DIAMETER.

The terminal  $\frac{3}{4}$  inch of the duct was less than the normal calibre, with a valvular fold completely obstructing the lumen. It was twice aspirated of  $3\frac{1}{2}$  pints of bile, and finally choledochostomy was performed, but the patient died two days after.

(No. 1,419, Guy's Museum.)



PLATE XXV



FIG. 55.—CYSTS IN LIVER FORMED BY DILATED HEPATIC DUCTS.  
(No. 2,758c, Royal College of Surgeons Museum.)

*To face p. 200.]*



had been removed the cystic duct was found to be the seat of a tumour, and, as this gave the impression of a new growth, the gall-bladder and its duct, along with the projecting lobe of the liver, were removed by means of an elastic ligature. The patient made an uninterrupted recovery, and was heard of in 1902 as being quite well.

The tumour was examined by Mr. Targett, who reported that it was inflammatory in origin, and not due either to tuberculous disease or to cancer.

Drs. Wilks and Moxon ('Pathological Anatomy,' p. 485) describe what appears to have been an extreme example of a duct papilloma in a child of four years of age. The common bile-duct was dilated so as to form a cyst as large as a child's head, and was occupied by crowds of pedunculous myxomatous growths containing muscular fibre.

In Dr. Rolleston's paper a case is referred to which makes it probable that an adenoma preceded cancer. Papilloma is probably an earlier stage of cancer, and is rare.

Sir W. H. Bennett removed one from the common duct of a woman, aged fifty-eight, in St. George's Hospital, the specimen being shown at the Pathological Society of London in May, 1894. The growth was white and somewhat granular to the naked eye, and was in immediate relation with an impacted gall-stone. The papilloma was apparently due to the irritation of the calculus, which, judging from the history, had been impacted for two months.

*Of the malignant tumours* we must take into consideration the two classes, sarcoma and cancer.

*Cancer* may be primary or secondary, the former arising most frequently as the result of gall-stone irritation, the latter by extension from neighbouring organs.

*Primary malignant disease of the bile-ducts* is almost invariably, as might be expected from their histological structure, columnar-celled carcinoma. Musser collected eighteen cases, and found all of them to be formed by cylindrical-celled carcinoma; while out of other sixteen collected by Rolleston, fourteen showed similar histological characters, and two were cases of encephaloid cancer. That the growth may in the first instance be a papilloma, subsequently assum-

ing malignancy, is suggested by the fact that the tumour usually projects into the lumen of the canal as a villous-like mass, while at the same time the submucous tissue is infiltrated to a greater or less extent.

The tumour is most frequently situated in the common duct towards its lower end; but the cystic or hepatic ducts may be first affected. In Musser's eighteen cases the hepatic ducts were alone involved three times, the cystic and hepatic ducts once, and the common duct fourteen times. Rolleston reports seventeen cases, and in these the common duct alone was the seat of the tumour on fifteen occasions (the lower end of the duct being involved ten times), and the cystic duct twice; but in one of the latter cases there was also an apparently distinct growth at the lower end of the common duct.

As is the case in malignant disease of the gall-bladder, so here, systemic infection is rare; but, by extension, the growth may infiltrate the neighbouring structures, the liver being most frequently involved. The lymphatic glands in the gastro-hepatic omentum are, of course, involved sooner or later in all cases.

Dr. Rolleston draws attention to the fact that, out of the thirty-six cases collected, gall-stones were present only in half the number. He thinks that calculi are less frequently associated with primary cancer of the bile-ducts than with cancer of the gall-bladder. The same arguments apply, however, as in cancer of the gall-bladder, where the matter is fully discussed. In all probability the carcinoma is usually secondary to gall-stones, though these may not always be found, having passed into the bowel before the operation.

These growths are usually found between the ages of fifty and sixty, and, unlike cancer of the gall-bladder, where rather more than 75 per cent. of the cases occur in women, the disease attacks both sexes about equally. Out of thirty-six cases, twenty-one occurred in males and fifteen in females.

*Secondary carcinoma* may occur from extension of malignant disease into the bile-ducts. Thus, one may find cancer



of the bile-ducts supervening on cancer beginning in the liver, gall-bladder, pancreas, or intestine.

*Symptoms.*—If forming in the cystic duct, jaundice will be absent at first, only coming on when the growth advances so far as to press on the common duct and obstruct the passage of the bile, or when, as is not uncommon, catarrh of the bile-ducts supervenes. The gall-bladder enlarges at an early stage, and this will probably be the earliest sign; pain may be absent, unless gall-stones exist, when the usual spasmodic pains will occur so long as the muscular coat of the gall-bladder retains its contractile power.

When the growth is in the common duct, jaundice comes on at an early stage, and persists throughout, the liver gradually increasing in size, and the gall-bladder also enlarging ultimately; in the later stages, the changes in the character of the blood bring about a condition rendering the subject prone to hæmorrhages from the nose, bowel, etc., to a petechial eruption in the skin, and to a tendency to bleed from wounds, thus rendering operation extremely hazardous.

Associated with the absence of bile from the intestine there are usually, to a greater or less extent, gastro-intestinal symptoms, especially constipation or constipation alternating with diarrhœa.

Sometimes paroxysmal attacks of pain resembling that due to gall-stones are met with either before or after the development of jaundice, and may be due to associated calculi. Similar attacks of pain may be met with in carcinoma of the head of the pancreas or in growth involving the portal fissure.

The gall-bladder becomes distended and is palpable in a number of cases. Enlargement of the liver is slight, and secondary growths are comparatively seldom felt during life.

As biliary toxæmia appears, the symptoms are aggravated, ascites and œdema may appear, and the condition of extreme depression may terminate in exhaustion, coma, or delirium.

Suppurative cholangitis is apt to supervene, the case then taking on a more acute course, and being accompanied by

fever, ague-like attacks, and rapid loss of flesh and strength. If the tumour form in the hepatic duct, jaundice will be the earliest symptom, and the case will resemble one of obstruction in the common duct, with the exception of an absence of enlargement of the gall-bladder. Needless to say, the disease is uniformly fatal, though operation may delay the final catastrophe.

CASE 276, seen with Dr. Wardrop Griffith, is a good illustration of cancer of the ducts, and it shows also very well the usual history of gall-stone colic for a long period prior to the beginning of the malignant disease.

The patient, who was a woman, aged sixty-eight, gave a history of attacks of well-marked biliary colic since childhood. These seizures at first occurred about twice in the year; but latterly they had become much more frequent, and during the last year recurred about once a month.

The illness for which she sought treatment at the Leeds Infirmary began in April, 1899, like an ordinary gall-stone colic; but the jaundice, which was first noticed a week after the onset of pain, persisted, and got gradually more marked. Thence till her admission to hospital in July she had no recurrence of severe pain; but there had been occasional shooting pains in the upper abdomen, and constant tenderness in the region of the gall-bladder. She lost rapidly in strength and weight, and in July was 21 pounds lighter than she had been at the beginning of the year.

As medical treatment, persisted in for two and a half weeks, failed to give any relief, it was decided to have her transferred to the surgical side for operation.

When seen she was so ill that it was not considered safe to employ a general anæsthetic, especially as it was almost certain she was now the subject of malignant disease as well as gall-stones.

The operation was done on July 20, cocaine being the only anæsthetic used. The gall-bladder was aspirated, incised, and stitched to the parietes in the usual way, no attempt being made, on account of the weak condition of the patient, to exactly localize the obstruction.

Notwithstanding the apparent simplicity of the operation,

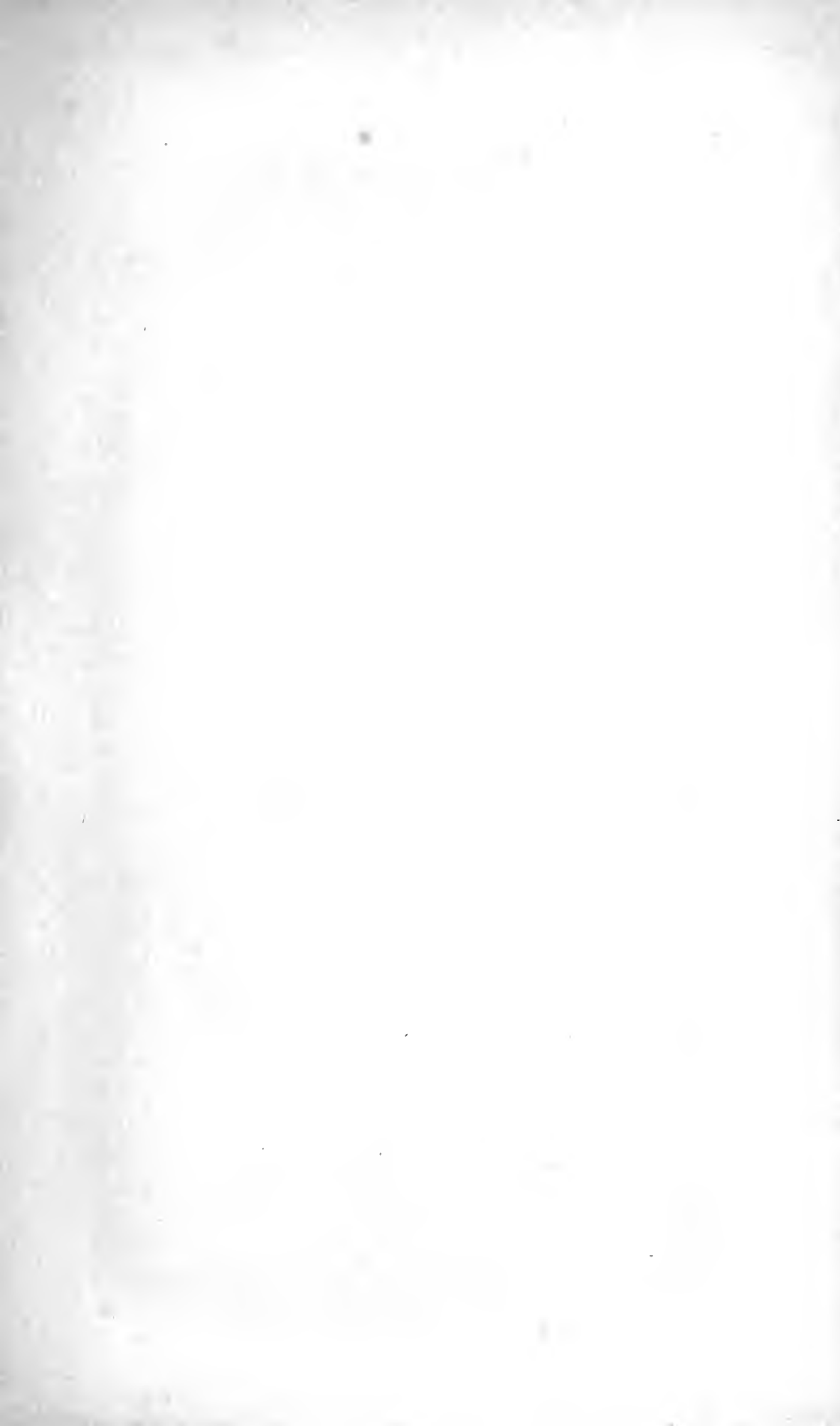


PLATE XXVI

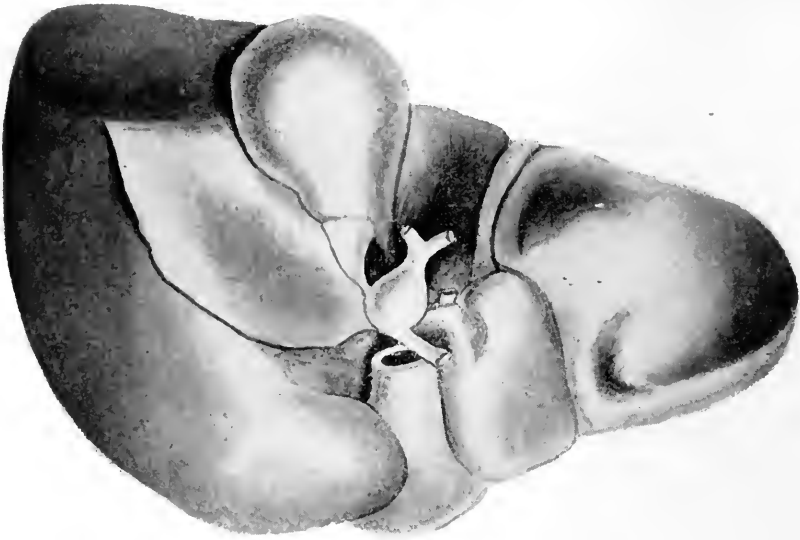


FIG. 56.—TUMOUR OCCUPYING THE JUNCTION OF HEPATIC, CYSTIC, AND COMMON DUCTS, AND COMPLETELY OCCLUDING THEM.

(From drawing by Dr. Robert.)

The hepatic ducts have been cut, and are turned forward.

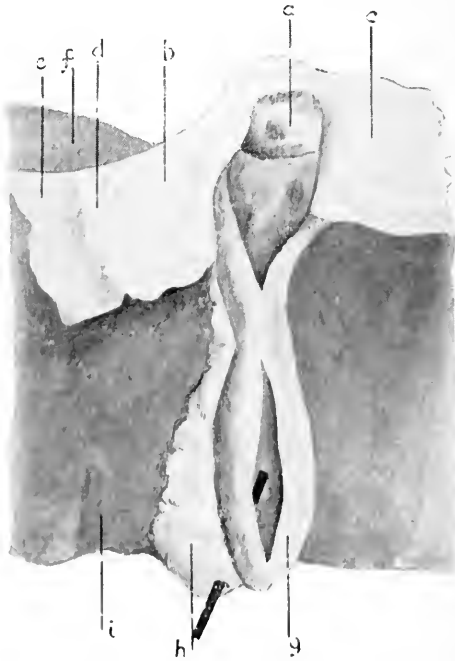


FIG. 57.—CANCER OF AMPULLA.

(After drawing in *Trans. Path. and Clin. Soc., Glas.*)

Parts shown by dividing the duct on into the duodenum: *a*, terminal part of duct, with tumour; *b*, *c*, duodenum laid open; *d*, pylorus; *e*, stomach; *f*, liver (shaded dark); *g*, collapsed gall-bladder; *h*, probe passed from gall-bladder through aperture, and emerging in the midst of adherent omentum; *i*, suspensory ligament.

and the absence of visceral exposure, there followed a considerable amount of shock.

There were hæmatemesis and some little hæmorrhage from the wound on the 21st and 22nd, and notwithstanding stimulation and other general treatment the patient gradually sank, dying from exhaustion on the 24th.

At the autopsy, besides extensive heart disease and granular kidneys, there were found two large stones, one in the gall-bladder, the other impacted in the cystic duct. Situated at the junction of the cystic, hepatic, and common bile-ducts was a growth about the size of a filbert, which was found, when the ducts were opened, to completely occlude them (see Fig. 56).

There were no adhesions in the neighbourhood, nor were there any secondary growths to be found. The stomach showed no evidences of ulceration, but there were slight signs of cirrhosis of the liver. There was no peritonitis.

**Cancer of the Ampulla of Vater.**—This condition was probably first described by McNeal in 1835 (in the *North American Archiv.*, Baltimore), and was later drawn attention to by Stokes in 1846 (*Dublin Quarterly Journal of Medical Science*, 1846). More recently the subject has been fully dealt with by M. Hanot (*Archives Générales de Médecine*, November, 1896), M. Durand-Fardel (*La Presse Médicale*, 1896), M. Rendu and Dr. Rolleston (*Medical Chronicle*, 1895, and *Lancet*, February 16, 1901). Rolleston (*Lancet*, February 16, 1901), in a most instructive paper on the subject of carcinoma of the ampulla of Vater, draws attention to the varieties of malignant growth which may be met with in this region.

The growth may arise in the mucous membrane covering the duodenal surface of the biliary papilla, in the mucous membrane of the ampulla of Vater, at the termination of the common bile-duct, and at the termination of Wirsung's duct. The *accompanying diagram* illustrates these distinctions.

Confusion may also arise between carcinoma of the head of the pancreas and primary carcinoma of the ampulla Vateri. Carcinoma of the pancreas, however, is spheroidal-celled, while carcinoma of the ampulla of Vater is columnar-

celled. Growth may also extend to the ampulla of Vater from the termination of the common bile-duct, or from Wirsung's duct. In coming to a decision as to the seat of origin of the growth in such cases, it may be pointed out that carcinoma of the ampulla of Vater may, when of considerable size, project as a tumour through the gaping lips of the biliary papilla, and be visible in the duodenum. This is not seen in cases of carcinoma of the pancreas or of the termination of the common bile-duct.

The clinical characters of biliary carcinoma of the ampulla of Vater are the same as those of primary carcinoma of the common bile-duct—viz., progressive jaundice and wasting, the patient finally passing into a condition of cholæmia or biliary toxæmia. It thus very closely resembles cases of carcinoma of the head of the pancreas, the only difference being that jaundice is, exceptionally, absent in the latter condition.

Rolleston considers that of the twenty-one recorded cases of carcinoma of the ampulla of Vater which he was able to collect, seven were genuine examples of this condition; the remainder were either carcinoma of the termination of the common bile-duct or of the duodenal surface of the biliary papilla. He reports the following case:

**Carcinoma of the Ampulla Vateri—Dilated Common Bile and Wirsung's Ducts—Death from Hæmorrhage into the Dilated Duct of Wirsung.**—A man, aged sixty-six years, was admitted into St. George's Hospital under my care on July 22, 1900, with jaundice, pruritus, weakness, and wasting. Ten weeks previously he had considered himself quite well; jaundice then appeared quite painlessly, and a month later he got weaker and felt drowsy; six weeks after the onset of jaundice the skin began to itch. There was no history of gall-stones. When examined on admission he was deeply jaundiced, and the skin showed the effects of scratching; the liver was enlarged, reaching to the fourth rib above, and extending two and a half finger-breadths below the costal arch in the right nipple line; the surface was smooth, and the gall-bladder could be indistinctly felt. No splenic enlargement could be made out. There was some abdominal distension and tender-

ness at a spot over the eleventh and twelfth ribs in the right hypochondrium, but no ascites. *Per rectum* nothing but an hypertrophied prostate could be felt. The urine contained albumin and bile, but no sugar. The patient had been sent to the hospital as a case of cancer of the liver. It appeared probable, however, that the growth was in the head of the pancreas. On July 25 there was some diarrhœa; on July 26 he vomited, had a rigor, and the temperature fell to 96° F.; the pulse was small, and he was collapsed. The abdomen moved well, and it appeared unlikely that perforation of the gall-bladder from overdistension, as in a case recorded by Coats and Finlayson (*Transactions Path. and Clin. Soc., Glas., vol. cxi.*), had occurred. Suppuration around the gall-bladder was thought of, but his condition precluded any surgical treatment, and he was given morphia. Death occurred eighteen hours after the onset of acute symptoms.

At the necropsy, performed by Dr. W. J. Fenton, the peritoneal cavity showed no recent peritonitis, but contained two pints of bile-stained fluid. A flat growth was found limited to the ampulla of Vater, and occluding the orifices of both the common bile-duct and the duct of Wirsung. This growth was not visible from the duodenum, and was only seen when the papilla was opened up. Microscopically, the growth was a columnar-celled carcinoma, and was found to be invading the smooth muscular tissue around the ampulla Vateri. The common bile-duct was greatly dilated with dark bile, and was as thick as one's thumb. When the finger was introduced into the duct and directed downwards towards the biliary papilla, the common duct was felt to end blindly like a test-tube. The hepatic and cystic ducts, and the gall-bladder were greatly dilated. No gall-stones were found. The liver weighed 4 pounds. It was enlarged, smooth on the surface, and deeply bile-stained. Microscopically, there was no cirrhosis, though the atrophied and degenerated condition of the liver cells allowed the existing fibrous tissue of the portal spaces to appear more prominent than in health. Wirsung's duct was tortuous and dilated throughout the whole of the pancreas. In the head of the gland there was a large cystic dilatation of the duct which

contained recent blood-clot; the rest of the dilated duct contained dark brown fluid. No calculi were seen. The tail of the pancreas was adherent to the stomach by old adhesions, evidently the result of past inflammation. To the naked eye the pancreas was extremely fibrotic. Microscopically, the glandular tissue of the organ was widely replaced by fibrous tissue, and, where it could be made out, was much disorganized. Numerous dilated ducts were seen, some of which contained microscopic calculi. There was some recent small-cell infiltration. The stomach and intestines showed signs of recent catarrhal inflammation. The kidneys presented senile changes and a few cysts. No secondary growths were found in any part of the body.

Dr. Haviland Hall (*Lancet*, April 19, 1902) reports the following case of primary carcinoma of the ampulla of Vater.

‘The patient, a man, aged forty-six, was first seen on October 6, 1900. He stated that he had been quite well until the preceding August; then he had a febrile attack (the temperature was from 103° to 104° F. for two days), accompanied with pain in the head and limbs. The attack closely resembled influenza. After three or four days the temperature became normal, and the patient suffered from itching and flatulence. About a week later he became jaundiced and felt ill, but there was no vomiting, diarrhœa, or pain. This condition continued up to the time that I first saw him. On examination, the thoracic viscera were found to be normal. The liver was uniformly and greatly enlarged, reaching nearly to the umbilicus, and the distended gall-bladder could be made out. The motions were clay-coloured and the urine was bile-stained. The temperature was normal. The patient had lost about 2 stones in weight since the commencement of his illness. Previously to the present illness the patient’s health had been excellent; there was no history of enteric fever, pneumonia, or any other serious affection. He was ordered chloride of ammonium (20 grains) every six hours.

‘I did not see the patient again until he was admitted into the Westminster Hospital under my care on January 5, 1901. On admission he was deeply jaundiced. The liver could be



felt three or four fingers' breadth below the costal margin ; it was hard and rather tender, and it appeared to be regularly enlarged. The gall-bladder was distended. The spleen could not be felt. There was no ascites and no œdema. The stools were semi-solid, clay-coloured, and very offensive. The urine was acid, bile-stained, and free from albumin and sugar. The temperature on admission was 98° F. On the 7th it rose to 102·4° F., falling the next day to 97·6°, but there was another rise on the 9th to 104° F. The patient became comatose at 4 p.m. on the 9th, having previously complained of severe headache for some hours. On the 10th the temperature gradually and steadily rose, and at 5 a.m. on the 11th it was 107° F., and the patient died.

' On post-mortem examination the liver weighed 7 pounds ; it was enlarged and of a deep green, almost black, colour. Its substance was fairly firm. The bile passages were much dilated throughout the organ. The gall-bladder was dilated and full of pale green bile of a watery consistence. The cystic duct was much dilated, and the common bile-duct was sufficiently large to admit the little finger in its main course. At the papilla in the duodenum the orifice was of the normal size, but the whole papillæ and a small portion of the duct behind the opening were enlarged and firm, so that a mass of the size and somewhat of the shape of a small bean lay beneath the duodenal mucous membrane. The pancreatic duct was much dilated, and bile could be made to flow through the unopened papilla by pressure on the gall-bladder. On slitting up the common duct from the papilla it was seen that there was a soft and ulcerating mass of material lying immediately within the orifice. From the surface of this a fluid having the appearance of pus could be scraped. The mass surrounded the entire lumen, but did not extend further along the duct than about  $\frac{3}{8}$  inch, and it did not invade deeper tissues. The tail of the pancreas was very dense, but the head was of normal consistency. Wirsung's duct was dilated throughout. No ascites was found in the abdomen. Microscopically, the growth was a columnar-celled carcinoma.'

A typical case, ending in rupture of the gall-bladder and

general peritonitis, is described by Dr. Coats and Dr. Finlayson, and the parts figured\* in the *Transactions* of the Pathological and Clinical Society of Glasgow (see Fig. 57).

*Diagnosis.*—The diagnosis of a primary growth of the bile-passages is frequently a matter of the greatest difficulty. Even in cases in which one can definitely say that the symptoms are not due to impaction of calculi in the ducts, it will be impossible to exclude malignant disease in adjacent organs, such as the head of the pancreas or the duodenum. The chief symptoms commonly found in cancer of the head of the pancreas are those of cancer of the common bile-duct, and also of the ampulla of Vater—viz., progressive emaciation and jaundice, with enlargement of the gall-bladder. Impaction of a gall-stone in the common duct is usually indicated by a distinct history of biliary colic immediately preceding the onset of jaundice. Where, however, the cystic and common ducts are dilated as a result of the previous passage of gall-stones, impaction of a calculus may occur without any great pain. On the other hand, obstruction due to malignant disease may be accompanied by attacks of pain resembling biliary colic.

The distension of the gall-bladder which is supposed to be the rule in obstructive jaundice other than that due to gall-stones may be absent, owing to contraction of the gall-bladder following previous cholelithiasis.

As time goes on and the case progresses it becomes obvious that the cause of the jaundice is malignant disease, but in the early stages it is absolutely impossible, in the majority of cases, to make a certain diagnosis. The difficulty can only be cleared up by an exploratory operation, which should be performed at an early period. If gall-stones are present they can be removed, and if the condition is due to malignant disease it may be possible to remove the growth, or, if this be impracticable, to perform cholecystenterostomy.

Cystic dilatation of the bile-ducts is often indistinguishable from enlargement of the gall-bladder, as in Terrier's third and in my own first case, for which, indeed, it is usually mistaken; but it may resemble a cyst of the pancreas, as

\* *Transactions* of Pathological and Clinical Society, Glasgow, vol. iii,

in Dr. Arnison's case, in M. Terrier's first case, and in my case (No. 511), or a hydatid tumour of the liver, as in Terrier's second case, and in Dr. Russell's patient. But, as the treatment in all these conditions is abdominal section, no harm will be done if the diagnosis is only completed when the abdomen is opened.

*Treatment.*—The operative treatment of these tumours is in its infancy. If the cause be a removable one, such as a gall-stone, it should be taken away. Choledochostomy has not yielded good results in cystic dilatation of the bile-ducts, my own cases being, I believe, the only examples of complete recovery after the operation, whereas the experience of performing an anastomosis between the cyst and the intestine, though as yet slight, has been so satisfactory as to establish the claim to its being considered the best method of treatment.

In malignant disease an accurate diagnosis can often only be made after the abdomen is open. In some cases the condition of the patient or the extent of the growth may only permit a palliative operation. In such a case, the dilated gall-bladder or ducts may be opened and drained or short-circuited into the duodenum or colon. In two cases only has removal of such a growth been performed, by W. S. Halstead (*Boston Medical and Surgical Journal*, December 28, 1899) and by W. J. Mayo (*St. Paul's Medical Journal*, June, 1901). As these cases illustrate the various operative procedures that may be necessary, they are given in some detail.

Halstead's patient was a woman, aged sixty. Her illness commenced with itching of the skin, which came on suddenly, and soon became severe. The patient said that the jaundice did not appear for nearly a month after the onset of the itching. There were no chills, no fever, and no sweating. Following the extraction of a tooth she had persistent bleeding of the gums, and at times the hæmorrhage was profuse. Five months before the onset of the itching she had attacks of severe pain in the epigastrium, unaccompanied by vomiting, fever, or sweating. The stools were light in colour for two or three days at the beginning of the

attacks, but there was no jaundice noticed. On examination the liver was enlarged and the gall-bladder greatly dilated.

*Operation, February 14, 1898.*—The gall-bladder, common and cystic ducts, were much dilated. The gall-bladder was incised and clear fluid with some miniature gall-stones removed. The common duct was explored through an incision, and what seemed to be a small, hard stone felt at the ampulla of Vater. The duodenum was incised and the mass was found to be a carcinoma.

A wedge-shaped piece of the duodenum with the apex at the mesenteric border was incised with about  $\frac{3}{4}$  inch of the common duct and a shorter piece of the pancreatic duct. An end to end anastomosis of the duodenum was then made, the common and pancreatic ducts being transplanted into the duodenum along the line of suture. The linear incision in the common duct was sutured and the gall-bladder drained, a gauze drain also being passed down to the sutured intestine. The patient recovered from the operation, and ten weeks later cholecystenterostomy was performed, no recurrence being found at the second operation. She died, however, from recurrence six months later.

W. J. Mayo's patient was a woman, aged fifty-nine, who had suffered for many years from biliary colic. For twelve months the patient had been losing weight (40 pounds in all). She was somewhat emaciated, and there was marked cachexia and moderate jaundice. The liver was enlarged, but the gall-bladder could not be felt.

*Operation, November 3, 1900.*—A single non-faceted stone was removed from the gall-bladder. No stone could be felt in the ducts. Gall-bladder drained.

For forty-eight hours drainage of bile was free, but gradually increased in quantity up to 2 or more pints a day; the skin became greatly irritated from the discharge, and examination showed that a large part, if not all, of the pancreatic secretion was being discharged with all of the bile. The jaundice disappeared, but, the discharge of bile continuing, the abdomen was reopened on January 31, 1901. At the extreme end of the common duct a hard body could be felt through the wall of the duodenum, which was sup-

posed to be a calculus. An incision was made, 2 inches in length, in the anterior wall of the duodenum, exposing a grayish-white mass which was strictly localized to the site of the papilla of the common duct. Its size did not exceed the end phalanx of the forefinger; about one-third of its length projected into the lumen of the duodenum, and two-thirds posterior to the intestinal wall. The tumour was excised, exposing the free end of the common duct. The removal was made partly with the knife and partly with the cautery, and finally the whole surface was seared with the cautery. The duodenal incision was sutured, a small gauze drain inserted, and the wound closed, the gall-bladder fistula being undisturbed. The discharge from the fistula ceased in three weeks, the stools became normal in appearance, and the gain in weight and general appearance was most rapid.

Microscopic examination showed the growth to be a cylindrical-celled carcinoma.

The following case was under my care in the Leeds General Infirmary, but it scarcely comes under the same category as the cases related, since the disease had extended to the neighbouring organs.

CASE 536.—M. T., aged thirty, sent by Dr. Pritchard, Dewsbury. Three years ago the patient had an illness characterized by abdominal pain and jaundice, lasting for three or four weeks. The jaundice passed off, but three months afterwards the attack of pain was repeated, but not followed by jaundice. Since then he had had several attacks, but no further jaundice. The pain was in the right hypochondriac region, passing below the right shoulder blade; he had lost a stone in weight. When seen by me the patient was very slightly jaundiced; the stomach was markedly dilated; there was no tenderness, but an indefinite swelling was felt above and to the right of the umbilicus.

*Operation, April 18, 1901.*—The growth was found involving the inner part of the duodenum, from which it had extended to the pylorus and head of the pancreas. While separating adhesions a perforation of the duodenum was discovered, and as this could not be safely closed by sutures, an attempt was made to remove the disease. It had

evidently started in the region of the papilla, and to effect its removal it was necessary to excise a portion of the inner wall of the duodenum. As the pylorus, and part of the head of the pancreas were involved in the disease an extension of the operation was called for, the bloodvessels being tied as they were divided. The walls of the duodenum and stomach were brought together by sutures, and as it was clear that the common duct would be obstructed, the gall-bladder was drained, with a view to cholecystenterostomy at a later date if the patient recovered. The patient suffered considerably from shock after the operation, and though he rallied at first, he died a few days later from exhaustion.



PLATE XXVII.

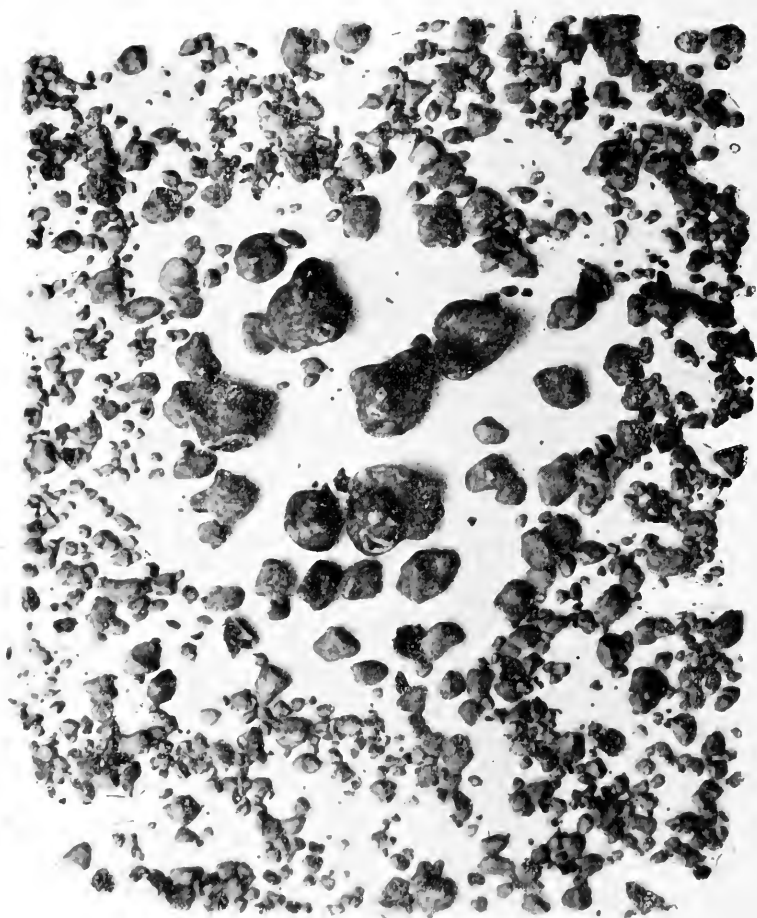


FIG. 58.—ONE HUNDRED AND FORTY-FIVE GALL-STONES, ACTUAL SIZE,  
REMOVED BY CHOLECYSTOTOMY.

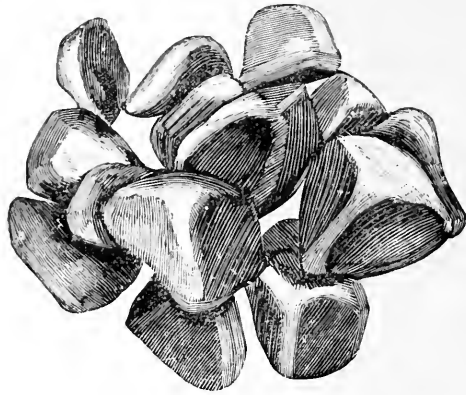
(Case 455.)

*To face p. 215.]*

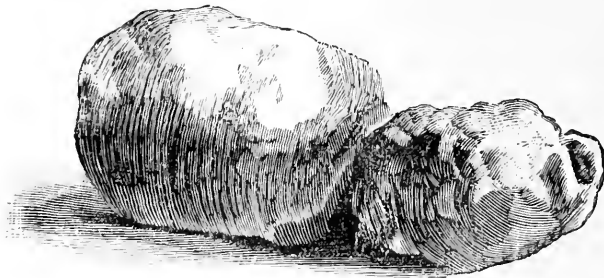




PLATE XXVIII.



A.—From Case 1.



B.—From Case 9.



C.—From Case 27.

FIG. 59.—EXAMPLES OF GALL-STONES.



PLATE XXIX.

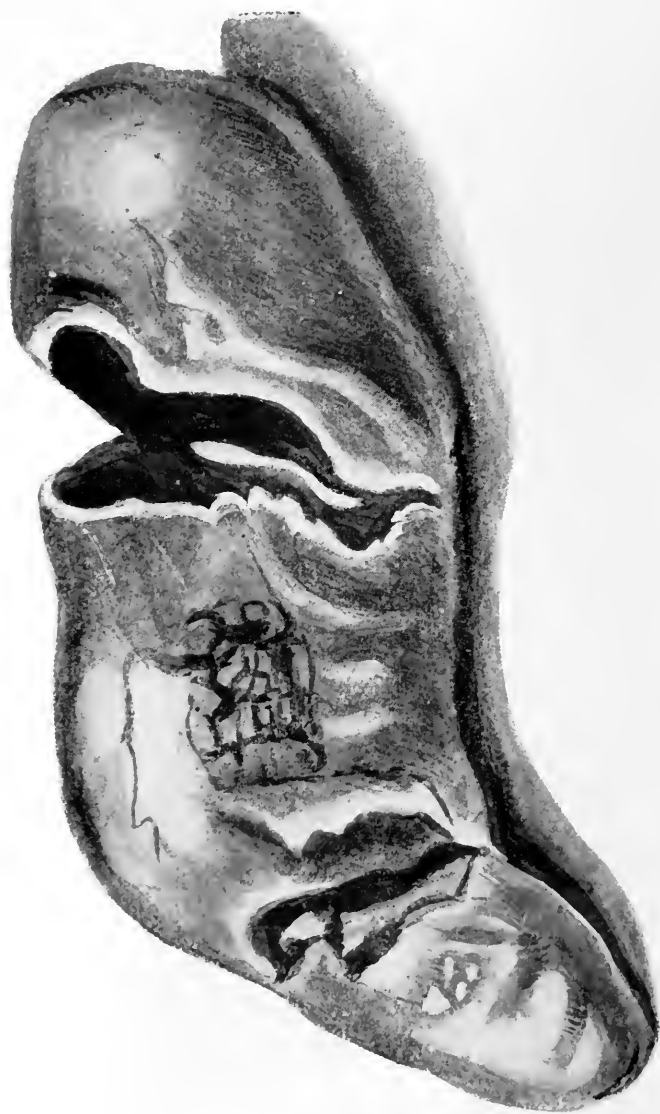


FIG. 60.—LARGEST GALL-STONE EVER DESCRIBED.

*To face p. 215.*

## CHAPTER VII

### GALL-STONES, OR CHOLELITHIASIS

THE importance of this subject may be gathered from the facts that post-mortem records on persons of all ages and both sexes prove gall-stones to be present in from 5 to 10 per cent. of all Europeans; in Strasburg the record being 12 per cent. (Schroeder), in Kiel 5 per cent., and in Manchester 4·4 per cent. (Brockbank).

**Pathology and Etiology.**—Gall-stones, which when small are often spoken of as biliary sand, may vary in size from a concretion just perceptible to the naked eye (Fig. 58) up to a mass the size of a tennis-ball, or even larger (Fig. 59).

The following description and illustration (Fig. 60) of the largest gall-stone that has, so far as we know, been described are taken from Mr. Hutchinson's *Archives of Surgery* for July, 1891, the original source being Dr. Spen's translation of Dr. Aug. G. Richter's work, entitled 'Medical and Surgical Observations,' published in 1793.

*Enormous Gall-stones removed after Death.*—Concerning this case Richter writes: 'There was a stone in the ductus choledochus which, on account of its uncommon size, I have caused to be engraved in the annexed figure. It weighed 3 ounces 5 drachms. All round the stone was fluid bile, so that this fluid had evidently passed by the stone into the duodenum. It fell into three pieces on being taken out. The external surface resembled a very firm extract of liquorice. On some places there were evident marks of other stones adhering to it. The thick end of the stone was in the duodenum; the most pointed was turned towards the neck of the gall-bladder.'

They may be round, egg-shaped, barrel-shaped, elongated with pointed ends, or angular, the surface being smooth, mammillated, or irregularly faceted. Gall-stones, when large, are often single, but when small or moderate in size they are usually numerous, and several hundreds may be found; for instance, in Case 107, there were successfully removed by cholecystotomy no less than 720 gall-stones from the gall-bladder and dilated cystic duct of a woman aged fifty-six, and cases are on record where over a thousand gall-stones have been removed. In a patient of mine operated on in the Leeds Infirmary there were considerably over a thousand removed, and in one recently reported by Dr. E. T. Davies (*British Medical Journal*, p. 201, 1903) no less a number than 1,754 gall-stones were removed from a woman aged fifty-one. Their colour is variable; in some cases it is white or gray, in others very dark, or even quite black, but the usual colour is a dark yellow or brown. In consistency they are ordinarily firm, but as a rule they may without much difficulty be fractured by pressure between the thumb and forefinger, the fracture being crystalline; they may, however, be as hard as a lithic acid calculus, or as soft as half-set putty. The chief constituent of gall-stones is cholesterin, which always occurs in the crystalline form; but bile-pigments, bile-salts, lime, mucus, degenerated epithelium, and rarely foreign bodies, may enter into their composition. Margarate, stearate, and palmitate of lime, combined with mucus, usually form the cement which binds the cholesterin crystals together to form a concretion.

Gall-stones formed almost entirely of bile-pigment may be seen. On two occasions among the series of operations given in the Appendix, there were found soft concretions of this nature in large numbers in the hepatic ducts within the liver, and in one case where jaundice had been present for many years the common duct was occupied by a black putty-like substance, which had to be removed by the scoop. Since cholesterin is the chief constituent of gall-stones, in considering their formation our attention must be directed chiefly to the physiology of this monatomic alcohol, which occurs normally not only in the blood, but also in the various

organs of the body. Although cholesterin is always present in the blood in a proportion—according to various authors—varying from 0.045 to 0.12 per cent., very little is known of the processes which determine its existence. As there is no proof that the liver excretes cholesterin from the blood, or that it is a result of hepatic metabolism, we are driven to the conclusion that it is formed in the bile-ducts or the gall-bladder; and, as it is found in other mucous channels not transmitting bile, there is no reason to believe that it is formed from any constituent of the bile, but rather that it is a product of the epithelium of the bile passages.

That cholesterin, when ordinarily present in all persons, should form concretions in some and not in others may depend on several causes; possibly in some cases cholesterin occurs in positive excess, while in others there may be a diminution of the bile-salts which should hold it in solution, or it may be precipitated from solution under certain conditions. There is no doubt that catarrh of the mucous membrane of the bile passages increases the amount of cholesterin present, and that the longer bile remains in the gall-bladder the more cholesterin will it contain. Anything, therefore, which causes stagnation of bile may predispose to gall-stones. On the other hand, whatever leads to a regular emptying of the bile passages will tend to clear out such detritus as cast-off cells, incipient collections of cholesterin crystals and mucus, and thus to prevent the formation of gall-stones.

The view is gaining ground that all biliary calculi have a bacterial origin, the organisms principally concerned being the *Bacillus coli communis* or the typhoid bacillus, though other organisms may participate in the process. Bernheim, in 1880, was the first to direct attention to the connection between typhoid fever and cholelithiasis. In Professor Halstead's clinic about one-third of the cases operated on for gall-stones gave a history of typhoid fever at intervals of from a few months to several years. We have noted the previous history of typhoid in many cases of cholelithiasis, and in some the relation between the two has seemed very direct.

The occurrence of the fever may be long antecedent to the appearance of symptoms of cholelithiasis, and yet the relationship may be a true cause and effect. Thus, in Case 262 the patient, aged forty-eight, gave a history of typhoid fever twenty years previously, accompanied by pain and tenderness beneath the right costal margin, and followed within the year by so-called 'spasms,' which had continued, with intermissions, for the whole intervening period. The attacks for the last two years had been regularly followed by slight jaundice and accompanied by pain over the left side of the abdomen and by vomiting, the whole leading to great deterioration of health, and to loss of weight to the extent of 3 stones. When seen there was tenderness at a point midway between the ninth costal cartilage and the umbilicus, which we have found to be almost as significant of inflammatory trouble about the gall-bladder as is tenderness at McBurney's point of appendicitis. This sign, together with slight icterus after each attack, led to the diagnosis of gall-stones, although the pain had latterly been more especially on the left side of the abdomen. The left-sided pain, as we pointed out some years ago, is generally, if not always, associated with adhesions between the pylorus and gall-bladder or bile-ducts, and from observations on a number of cases it almost seems as if, when this event occurs, a transference of the pain may take place from the right to the left side, as in reflected pain in other parts of the body. In the first case on which I made the observation there was also well-marked dilatation of the stomach, showing that the visceral adhesions were producing a difficulty in the passage of food into the duodenum. At the operation the diagnosis was confirmed in every particular, and after the removal of forty-six gall-stones from the cystic duct (one of them projecting into the common duct), and detaching adhesions, the gall-bladder was drained. Recovery was uninterrupted, and the patient is now well in every respect. There has been no pain since and no vomiting, digestion is perfect, and the patient has regained her lost weight. In numerous cases since, these original observations have been confirmed by myself and many other surgeons.



In 1886 microbes were found in biliary calculi by M. Galippe. Gilbert, Dominici, and Fournier examined calculi from seventy cases, and found the *Bacillus coli communis* either living or dead in one-third of the cases. They have performed a number of experiments (*Archives Générales de Médecine*, September, 1898) on animals, which seem to show that not only do the *Bacillus coli communis* and the typhoid bacillus set up a cholecystitis, but that this tends to the formation of gall-stones. In two cases they succeeded in inducing the formation of perfect calculi in a dog and a rabbit injected with the *Bacillus coli communis*. Mignot (*ibid.*, August, 1898, and *British Medical Journal Supplement*, December 3, 1898) has not only confirmed these observations, but has gone further. He succeeded in producing typical calculi in guinea-pigs, and obtained the following results :

1. Foreign bodies when introduced into the gall-bladder can stay there for an indefinite time, provided they are aseptic, without causing inflammation or precipitating the solids from the bile.

2. Foreign bodies previously impregnated with virulent micro-organisms cause a more or less intense cholecystitis, and precipitate the solids from the bile. As long as the bacteria retain their virulence, however, they cannot form a calculus, but only a sediment mixed with pus. This sediment has no tendency to cohere, or to adhere to foreign bodies.

He then shows why previous attempts to form calculi have failed. The bacteria must be attenuated, not virulent. This is best attained by growing them for some months in bile to which constantly decreasing amounts of broth are added. When sufficiently attenuated they are no longer pathogenic when injected into the cellular tissue of animals. On injecting these into the gall-bladder stones are occasionally formed, but more often the bacteria are washed out into the intestine. If, however, a foreign body, especially if porous, such as cotton-wool, be placed in the bladder and fixed to its walls to prevent expulsion, a stone is formed round it with the greatest certainty. Five or six months are

required for the perfect formation of a calculus. The form of bacteria injected seems to be of secondary importance. Mignot has proved that the typhoid bacillus, the *Bacillus coli*, staphylococci, streptococci, and even the non-pathogenic *Bacillus subtilis*, are capable of giving rise to calculi, and probably a great number of other organisms are equally potent.

Cushing (*Johns Hopkins Hospital Bulletin*, No. 86, May, 1898) has reported several cases of cholelithiasis following typhoid fever occurring at the Johns Hopkins Hospital.

One case of empyema of the gall-bladder with numerous calculi was operated on by Halstead three and a half months after an attack of uncomplicated typhoid. The *Bacillus typhosus* was cultivated from the contents of the gall-bladder.

In another case of cholelithiasis there was no history of typhoid fever, but the *Bacillus typhosus* was grown in pure culture from the fluid in the gall-bladder. The blood-serum also gave the Widal reaction.

He has also reported five other cases in which cholecystotomy was performed for gall-stones at varying intervals after an attack of typhoid fever. The *Bacillus coli communis* was cultivated from the contents of the gall-bladder, but no typhoid bacilli were found. From a history of the cases he draws the following conclusions:

1. The bacillus during the course of typhoidal infection quite constantly invades the gall-bladder.

2. The organisms retain their vitality in this habitat for a long period.

3. In the course of time the bacilli are almost invariably found to be clumped in the bile, suggesting the occurrence of an intravesical agglutinative reaction.

4. These clumps presumably represent nuclei for the deposit of biliary salts, as micro-organisms may with regularity be demonstrated in the centres of recently-formed stones.

5. Gall-stones being present in association with the latent, long-lived, infective agents, an inflammatory reaction in the viscus of varying intensity may be provoked at any subsequent period.

Among the remoter causes we must consider age, sex, habits, dress, diet, diathetic condition, and disease.

*Age.*—Although gall-stones may occur at any age, even in the newly-born, they are rarely found under the age of twenty-five or thirty. Schroeder says that under the age of twenty the percentage is 2·4; from twenty to thirty, 3·2; from thirty to forty, 11·5; from forty to fifty, 11·1; from fifty to sixty, 9·9; and over sixty, 25·2 per cent. Judging from a paper (*British Medical Journal*, April 8, 1899) by Dr. G. F. Still, biliary calculi in young children are met with not infrequently. He gives three cases in which a necropsy had been performed within six months at the Great Ormond Street Hospital for Children. In the first, a child aged nine months, there were vomiting and clay-coloured stools, but neither jaundice nor colic. After death (which occurred from other causes) there were found eleven small, black, friable calculi composed of pigment, three of which were impacted in the common duct. The second case was that of a girl, aged eight months, who died of tuberculous meningitis. There was neither jaundice nor abdominal pain; but at the post-mortem examination there were found three minute calculi of pigment in the gall-bladder. In the third case, a boy (age not given), there were abdominal pain and vomiting, but no jaundice; the calculi were of the same kind. He described a fourth case where there had been recurrences of vomiting, abdominal pain, and jaundice. Altogether he has been able to collect twenty cases in children, ten of which were in infants. He was of opinion that biliary calculi might be formed during intra-uterine life, and thought that the viscosity of the bile in infancy was probably connected with the formation of such concretions.

*Sex.*—Gall-stones occur more frequently in women than in men. Schroeder states that in Germany they are found in 20 per cent. of female and in 4·4 per cent. of male necropsies. Out of 228 autopsies on women in the Manchester Royal Infirmary, Dr. Brockbank found 18, and out of 542 post-mortem examinations in men 16 cases of gall-stones, which gives 7·9 per cent. in females, and 2·9 per cent.

in male subjects. Pregnancy would seem to be a factor in the causation of gall-stones, as in a large series of cases 90 per cent. of the women affected had borne children. The wearing of corsets, which tends to force down the front of the liver, and to depress the fundus of the gall-bladder, is probably a distinct etiological factor, especially when combined with deficient exercise.

*Habits.*—Want of exercise, whether from lethargy or from necessity, as in some forms of chronic heart disease, leads to stagnation of bile in the gall-bladder, and to the deposition of cholesterin, since the gall-bladder is unaided in its expulsive efforts by the contraction of the abdominal muscles.

*Diet.*—The following facts go far to prove that diet exercises a strong influence in the formation of gall-stones. It seems probable that free cholesterin in the bile passages is due, in some cases, to a deficiency of its solvents in the bile, these solvents being the glycocholate and taurocholate of soda which arise from the metabolism of nitrogenous foods. If the supply of nitrogen in the food be limited, the bile-salts are likely to be diminished, and cholesterin may be precipitated. This may serve to explain the presence of gall-stones in gouty persons, who, on account of their uric acid diathesis, limit their intake of nitrogen. The larger consumption of farinaceous food in Germany may also serve to explain the greater prevalence of gall-stones there than in England, where meat enters more extensively into the dietary. In diabetes, where nitrogenous food is prescribed, gall-stones are rarely found. Dr. Thudichum, in his work on gall-stones, states that he cannot find any recorded instances of the discovery of gall-stones in the wild carnivora, though on two occasions they have been found in the gall-bladders of domesticated carnivora. On the other hand, Dr. Brockbank could find no evidence of their occurrence in wild herbivora, though at times they are found in domesticated horses, cattle, and sheep, as well as in pigs. Moreover, in pampered dogs fed on farinaceous foods they are found occasionally. In man, who is omnivorous, they occur in from 5 to 10 per cent. It will thus be seen that in those who take an

abundance of albuminous materials in their food, and where, therefore, the bile-salts are in sufficient quantity, there is little tendency to the deposition of cholesterin, whereas when little albuminous food is taken, and the bile-salts are presumably insufficient to hold the cholesterin in solution, gall-stones are likely to form; this tendency is aided by insufficient exercise, as in stall-fed cattle, pampered dogs, and indolent men. The formation of some gall-stones containing lime has been attributed to the drinking of hard water, but this is by no means proved; an insufficiency of diluent drinks may, however, possibly act as a cause.

A case of Dr. Hofman's is of interest as showing the time in which gall-stones may form. In April, 1895, he removed a number of stones from the gall-bladder, and used silk sutures; the symptoms returning at the end of 1896, cholecystotomy was again performed in June, 1897, and several good-sized stones were removed and found to have the silk sutures as their nuclei. And I know of one case where the silk suture employed to stitch up the opening in the common duct in a choledochotomy led to the formation of a concretion, which was fortunately passed naturally, and an examination of the gall-stone showed the ligature to be the nucleus.

**Symptoms.**—In discussing the symptoms of cholelithiasis, we must note, in the first place, that gall-stones may be found post-mortem without having produced any symptoms during life. In such cases they are, as a rule, in the gall-bladder, while the ducts are free, and there are no signs of irritation in the shape of adhesions. Indeed, there can be no doubt that a large gall-stone may even ulcerate its way into the bowel, and produce symptoms of intestinal obstruction, with few or no signs to indicate that such serious organic mischief has been going on. Several such cases are related in the chapter on Intestinal Obstruction from Gall-stones. It follows, therefore, that in considering cases of intestinal obstruction gall-stones cannot be excluded, though there has been no symptom of cholelithiasis. It is just possible that as some persons pass urinary stones with few or no symptoms, so others may pass small biliary calculi; this, however, has

yet to be proved, and in the meantime it is difficult to explain why in some persons gall-stones should produce such serious troubles, while in others they give rise to none at all.

In certain cases there may be a history of dyspepsia, with depression of spirits and a feeling of discomfort or weight, or even ill-defined pains over the right side of the abdomen, but an entire absence of those characteristic symptoms which give definiteness to diagnosis.

The ordinary symptoms of cholelithiasis are paroxysmal attacks of pain, which, occurring at irregular intervals, and often without apparent cause, start in the right hypochondrium or in the epigastrium, and radiate thence over the abdomen and through to the right subscapular region. These attacks are often accompanied by sickness or vomiting, and if severe by collapse. They may be followed by jaundice, with its well-known symptoms, but this is frequently absent. At times a feeling of fulness in the right hypochondrium accompanies the attack ; but the formation of a tumour does not occur, as a rule, unless the ducts are blocked. Accompanying these special symptoms will usually be found depression of spirits, want of appetite, dyspepsia, and loss of weight.

According to Naunyn, there is a regular as well as an irregular form of the disease. The former occurs where the calculi are simply lodged in the gall-bladder or pass along the ducts ; the latter is seen when there is infectious angiocholitis, with abscess in the liver, fistula, or other complications. (See section on inflammatory affections of the gall-bladder and bile-ducts.)

The following symptoms will be considered in detail :

(a) *Paroxysmal pain*.—For the most part the patient complains of pain under the right costal margin, or in the epigastrium, whence it radiates over the abdomen and to the right subscapular region ; but in some cases the pain radiates to the left shoulder. These attacks come suddenly when the patient is quite well, and usually end by causing nausea or an attack of vomiting. The vomiting leads to relaxation of the duct, and if the gall-stone be small it may pass on and thus end the attack. The seizures come on without apparent

cause, although at times they may appear to be brought on by exertion or by taking food. Not infrequently, after an attack has passed off, a dull aching is felt in the region of the gall-bladder for some time, perhaps until another seizure. In several cases we have noticed the pain to begin on the left side over the stomach, and in these we have always found adhesion of the stomach to the gall-bladder or bile-ducts.

The pain may be irregular, at times simulating angina pectoris and being almost limited to the pre-cordial region, or epigastric, simulating ulcer of the stomach, or genito-crural and resembling renal calculus. The absence of other cardiac, stomach, or renal symptoms, and the presence of tenderness over the gall-bladder or in the line between the umbilicus and the ninth costal cartilage, will usually enable a diagnosis to be made.

It is not uncommon for the pain to commence in the epigastrium, and to radiate thence all over the abdomen, especially into both hypochondriac regions; it may then pass through to the midscapular region, and even pass up to the head and neck or down to the loin.

(b) *Vomiting*. — Though, as a rule, the vomiting is paroxysmal and associated with colic, it may be almost continuous, and so of itself prove dangerous. In one case of this kind (No. 29) the patient was so weak from persistent vomiting that it was feared she scarcely could bear the operation it was necessary to perform. Even after the source of irritation had been removed the vomiting persisted for days; ultimately, however, she made a good recovery. In another case, which was seen in the South of Ireland (No. 92), the vomiting had been so incessant that the patient had been fed almost solely by nutrient enemata for six weeks before operation, and even afterwards, though the operation was satisfactory and the after-progress in other respects all that could be desired, the emesis persisted for a fortnight, and ultimately caused the death of the patient from sheer exhaustion. The vomiting, as a rule, occurs towards the end of the seizure, and, in fact, frequently determines its cessation. In such cases the stomach contents are first

rejected, after which, if the common duct be free, bile is vomited; at times, however, in the severe cases, vomiting becomes grumous or even stercoraceous.

(c) *Collapse*.—Occasionally a patient becomes so profoundly collapsed from an attack of gall-stone colic as to give rise to great difficulty in diagnosis, the case being more like one of perforation of some abdominal viscus or of intra-abdominal hæmorrhage; but the history of previous seizures and of the onset of the attack from which the patient is suffering will usually help one to arrive at a correct diagnosis. The acute, agonizing pain may of itself cause death, as in the case of a lady seen by the author in consultation, and where the presence of gall-stones was diagnosed. The next attack of pain unfortunately proved fatal, and at the autopsy a gall-stone was found half extruded into the duodenum.

Not only may the agonizing pain of a single attack prove fatal, but repeated attacks of pain occurring without sufficient interval for recuperation may produce very serious deterioration of health, or even death from sheer exhaustion.

(d) *The formation of a tumour* in the region of the gall-bladder is seldom seen in acute cases; but it may be noticed with each attack, and is then due to the violent contraction of the muscular wall of the gall-bladder on its contents. It is, however, a frequent sign in the more chronic cases, and is fully discussed in the section on tumours of the gall-bladder.

(e) *The presence of gall-stones in the motions* after an attack is valuable evidence, but their absence does not negative cholelithiasis. It is quite usual in cases submitted to operation to find gall-stones where none had at any time been detected in the motions, although diligently looked for after attacks of colic.

The way to search for gall-stones is to let the patient pass the motion into a solution of carbolic acid, to have it well stirred, and then to pass it through a fine sieve with about  $\frac{1}{16}$  inch mesh.

(f) *Jaundice*.—So long as the gall-stones are in the gall-bladder or cystic duct there is nothing to prevent the bile passing down the common duct into the intestine. Jaundice



is therefore absent in the greater number of cases of cholelithiasis, or, if present, shows only as a slight icteric tinge in the conjunctivæ, which is induced by catarrh spreading from the gall-bladder and cystic duct to the common and hepatic ducts. Should the gall-stones be impacted in the common duct, the passage of bile is obstructed and jaundice ensues. Intermittent jaundice may also occur if a small gall-stone in the common duct acts as a ball-valve. In deeply jaundiced cases a decision concerning operation is frequently difficult, since chronic jaundice too often indicates malignant disease; and not only do patients with cancer bear operations badly, but when jaundice is associated with it there is the same tendency to persistent oozing of blood from the wound after operation as there is to spontaneous hæmorrhage where no operative measures have been undertaken, and though this hæmorrhagic tendency may be checked by the administration of calcium chloride, there is a want of healing power, and often a feeble resistance to shock, rendering operation in these cases more serious than in ordinary gall-stone subjects.

Dr. Ord drew attention to the production of intermittent pyrexia by gall-stones, and stated that his attention had first been called to this symptom by some remarks of the late Dr. Murchison on the case of a distinguished medical officer, who, after his return to England, was attacked at regular weekly intervals with paroxysms of shivering, followed by fever and sweating. He was supposed at first to have a recurrence of an old intermittent fever, and, later, to have hepatic abscess, but at last his symptoms indicated, and the necropsy proved, that his actual and only disease was a gall-stone so impacted as to produce great irritation, but not complete obstruction, of the common duct. Similar cases had been noticed by Charcot, who argued that the fever is due to the absorption of some poison into the blood. Dr. Murchison was of opinion that such attacks are not of a poisonous or septic origin, but are due to nervous irritation. From the cases we have seen, we should think that both explanations are admissible, the fever being not unlike that known as 'urethral,' in which the same contention as to

causation arises; but seeing that the bile is alway septic in these cases, we consider the chief cause of the fever to be ordinarily septic absorption from the damming back of the infected bile, which thus becomes absorbed by the lymphatics and conveyed into the blood-stream.

Dr. Osler says that the combination of the following symptoms is characteristic of the existence of gall-stones in the common duct, and is therefore valuable in distinguishing between this form of obstruction and that arising from malignant tumour alone:

1. Jaundice of varying intensity, deepening after each paroxysm, which may persist for months or even years.

2. Ague-like paroxysms, characterized by chill, sweating, and fever, and followed by deepening of the pre-existent jaundice.

3. At the time of the paroxysm pains in the region of the liver, with epigastric disturbance.

This opinion is fully borne out by our experience, and in a number of cases of jaundice of several months' duration, where there was this combination of symptoms, gall-stones were found in the common duct.

In addition to the symptoms already mentioned, the following complications may be met with, and may constitute the prominent conditions threatening life and requiring treatment, the original cause having, perhaps, disappeared or become masked by its more serious sequelæ:

1. Ileus due to atony of the bowel, leading to enormous distension, and to the symptoms and appearances of acute intestinal obstruction, apparently the consequence of the violent pain.

2. Acute intestinal obstruction dependent on:

- (a) Paralysis of gut due to local peritonitis in the neighbourhood of the gall-bladder.

- (b) Volvulus of small intestine.

- (c) Stricture of intestine by adventitious bands originally produced as a result of gall-stones.

- (d) Impaction of a large gall-stone in some part of the intestine after ulcerating its way from the bile channels into the bowel.

3. General hæmorrhages, the result of long-continued jaundice, dependent either on gall-stones alone or on cholelithiasis associated with malignant disease.

4. Localized peritonitis, producing adhesions, which may then become a source of pain even after the gall-stones have been got rid of. We believe that nearly every serious attack of biliary colic is accompanied by adhesive peritonitis, as experience shows that adhesions are found practically in all cases where there have been characteristic seizures.

5. Dilatation of the stomach dependent on adhesions around the pylorus.

6. Ulceration of the bile passages, establishing a fistula between them and the intestine.

7. Stricture of the cystic or common duct.

8. Abscess of the liver.

9. Localized peritoneal abscess.

10. Abscess in the abdominal wall.

11. Fistula at the umbilicus, or elsewhere on the surface of the abdomen, discharging mucus, muco-pus, or bile.

12. Empyema of the gall-bladder.

13. Infective and suppurative cholangitis.

14. Septicæmia or pyæmia.

15. Phlegmonous cholecystitis.

16. Gangrene of the gall-bladder.

17. Perforative peritonitis due to ulceration through, or to rupture of, the gall-bladder or the ducts, leading to extravasation of infected bile into the general peritoneal cavity.

18. Pyelitis on the right side due to a gall-stone ulcerating its way into, or an abscess of the gall-bladder bursting into, the pelvis of the kidney.

19. Cancer of the gall-bladder or ducts.

20. Subphrenic abscess.

21. Pleurisy or empyema of the gall-bladder.

22. Pneumonia of the lower lobe of the right lung.

23. Chronic invalidism and inability to perform any of the ordinary business or social duties of life.

24. Suppurative pancreatitis.

25. Chronic interstitial pancreatitis.

26. Infective endocarditis.

27. Cirrhosis of liver.

**Diagnosis.**—In the sections on tumours of the gall-bladder and on inflammatory affections of the bile passages the diagnosis of the complications of gall-stones is more fully dwelt on, so that here it is only necessary to discuss uncomplicated cholelithiasis. In this connection we have to consider the several ailments which may produce painful seizures in the right side of the abdomen. These are: hysteria or nervous spasms, locomotor ataxia, acute dyspepsia with flatulence, appendicular colic with appendicitis, right renal colic, acute and chronic pancreatitis, pancreatic calculus, gastric, pyloric, or duodenal ulcer, peritoneal adhesions to the pylorus or bowel, spinal neuralgia, malignant growth in or near the liver, pyloric stenosis, lead colic, angina pectoris, pneumonia and pleurisy.

The diagnosis rests chiefly on paroxysmal attacks of pain starting in the right hypochondrium and radiating thence over the abdomen and through to the right scapula, the attacks being often accompanied by vomiting or collapse, and sometimes followed by jaundice, although this is frequently absent. If jaundice be persistent and intense, without variation, the presence of malignant disease should be suspected; if it be dependent on gall-stones, ague-like attacks will probably occur.

Just as in appendicitis there is tenderness over McBurney's point, so in gall-stones, with very few exceptions, marked tenderness will be found on pressing the finger deeply over the region of the gall-bladder, or over some point in a line from the ninth costal cartilage to the umbilicus. In some cases the pain in the so-called 'spasms' is referred to the left side, radiating thence to the left infrascapular region; and in operating on such cases it will be found, as mentioned above, that the pylorus is adherent to the gall-bladder or cystic duct, or, as in a case on which I operated recently, a pancreatic calculus in the body or tail of the pancreas may be found (Case 487). In hysteria the irregularity in the character of the attacks, their association with other nervous phenomena, such as polyuria, globus hystericus, and so forth, together with the absence of collapse and of the physical signs of gall-stones, will enable one to arrive at a correct conclusion.

The lightning pains of abdominal crises of locomotor ataxia have led to errors in diagnosis, and we have heard of an operation having been performed in such a case, but the absence of knee-jerks and the well-known ocular and other nervous symptoms should prevent this mistake.

As a rule, there will be little difficulty in distinguishing cholelithiasis from acute dyspepsia with flatulence. The relief following on simple treatment, the pain over the stomach rather than over the gall-bladder, the discovery of a manifest cause, and the absence of serious symptoms, readily enable the distinction between so-called 'stomach spasms and gall-stones to be made.

In appendicular colic or appendicitis the almost invariable sign of tenderness at a point midway between the anterior superior spine of the right ilium and the umbilicus (McBurney's point); the presence of a swelling in the right iliac fossa, or near it; the presence of bowel symptoms in the shape of distension with rise of temperature; the characteristic initial vomiting; the commencement of the pain around or just above the umbilicus, and subsequently its transference to the right iliac region; and the absence of right scapular pain, render the diagnosis of this condition free from serious difficulty, though in cases of phlegmonous cholecystitis with peritonitis the latter has sometimes been attributed to appendicitis instead of to its actual cause. Confusion is most likely to occur in those cases in which the appendix, in consequence of the non-descent of the cæcum, lies in close relation to the gall-bladder. It must, however, be remembered that cholelithiasis and appendicitis may co-exist, and, as has been pointed out by Dr. Ochsner, of Chicago, the one condition may excite the other (*Philadelphia Medical Journal*, October 6, 1900). During four months, out of eighteen patients operated on for gall-stones in the Augustina Hospital, six suffered at the same time from appendicitis. The explanation given by Dr. Ochsner is that the gall-bladder becomes infected from the appendix, either at the time of the acute attack or during the chronic manifestation of the disease; hence he advises an examination of the appendix in all cases when operating on the gall-bladder.

In right renal colic the associated urinary symptoms, together with the condition of the urine and the pain over the kidney, passing down the right genito-crural nerve into the testicle, are distinctive. In lead colic the more or less persistent stomach-ache, the constipation, the absence of the usual gall-bladder paroxysms, and the presence of a blue line on the gums, will usually assist in the diagnosis, but in a doubtful case the result of treatment by iodide of potassium and saline aperients will soon clear up the diagnosis.

In pyloric stenosis, if accompanied by adhesions around the pylorus, the symptoms are not unlike those of gall-stones, with which, in fact, the affection may be associated, as in several cases related by me before the Clinical Society in 1889 (*Transactions of Clinical Society*, 1889), up to which time, I believe, the subject had not attracted attention. The presence of dilatation of the stomach, the characteristic vomit, the visible peristalsis in the stomach wall, the pain in the left of the abdomen, and the absence of the characteristic gall-bladder pain, will usually establish the diagnosis.

Pyloric or duodenal ulcer may simulate gall-stones, though the association of pain with food, and occurring one to two hours after it, the regular daily recurrence of pain, and the presence of stomach symptoms, generally render the diagnosis easy; but where perigastritis extends to and involves the common duct the presence of jaundice may give rise to doubt that can only be settled by exploration.

Chronic pancreatitis is so frequently associated with common duct cholelithiasis that the differential diagnosis is rather of theoretical than practical interest, especially as the treatment offering the best hope of cure is drainage of the bile-ducts. The pain in chronic pancreatitis radiates to the midscapular region, or round the left side, and the tenderness is in the epigastrium rather than in the gall-bladder region. The presence of jaundice depends on the anatomical relation of the head of the pancreas to the common bile-duct, for in some cases it embraces the duct, while in others it only lies close to it. Jaundice, therefore, is not a necessary symptom unless there be at the same time a gall-stone in the common duct. In some cases the swollen pancreas can be

felt on deep pressure in the epigastrium, especially if an anæsthetic be employed. Rapid loss of flesh is suggestive of pancreatitis. The presence of characteristic crystals arranged in rosette form, obtained from the urine by a special process of hydrolysis, has appeared to Mr. Cammidge and myself to be of undoubted diagnostic importance in cases where the pancreas is involved. Where the disease is inflammatory the crystals are more slender, and more speedily dissolve on boiling in acid than in malignant disease, where the crystals are broader and blunter, and take a much longer time to dissolve.

In acute pancreatitis the symptom of acute peritonitis starting suddenly in the epigastric region, and followed by distension, at first in the upper half of the abdomen, and later becoming general, may simulate acute cholecystitis due to gall-stones, but the site of the pain, the preceding history, the presence of a tumour of the gall-bladder, and the less severe collapse in cholecystitis, as a rule enable a diagnosis to be made. In such cases early treatment by exploration is called for; the diagnosis is therefore of theoretical rather than practical value.

In spinal neuralgia the presence of tenderness over the spine, the course of the pain along the branches of the corresponding spinal nerves, and the absence of collapse or of vomiting, put aside all difficulty in most cases.

In malignant disease the absence of pain at the onset, or, when present, its continuous character, the gradual and persistent loss of flesh, and the more marked failure of strength, usually indicate the serious nature of the affection. The persistence and gradual deepening of jaundice when once it supervenes, the frequent absence of ague-like attacks, and, if the disease involve the head of the pancreas, the almost constant presence of a palpable tumour due to enlargement of the gall-bladder, afford landmarks which, as a rule, prove true guides; but in many cases gall-stones exist along with malignant disease, and then these distinguishing symptoms become unreliable, though the rapid wasting and loss of flesh will often lead to a successful diagnosis of the co-existence of the two conditions. If nodules form in the

liver, and ascites with œdema of the feet supervene, the condition becomes manifest at once. The presence of small angiomas on the skin, especially on that of the abdomen, though not absolute proof, is a point in favour of cancer. Leser (*Münch. Med. Woch.*, December 17, 1901) drew attention to it, though Freund and Hollander had previously noticed it without laying great stress on its importance.

From right-sided pleurisy and pneumonia the physical signs afford positive evidence, and the symptoms are usually so distinct and definite as to leave no doubt.

Angina pectoris, by its sudden and irregular onset and the presence of collapse, may give rise to the suspicion of gall-stones, and I have seen the mistake made in practice; but the situation of the pain in the pre-cordial region, and its passage down the left arm, together with the usual circulatory disturbances, and maybe the presence of organic disease in the heart or vessels, will usually afford a sufficient guide to prevent a mistake being made.

Slight jaundice is very frequently present in true gall-stone seizures, even when the concretions are in the gall-bladder or cystic duct, but it may be so slight as to only show a mere doubtful tinge in the conjunctivæ. In some doubtful cases of so-called 'spasms,' as in other manifestations of cholelithiasis, it may be of importance to be able to discover mere traces of bile, for if definitely present in the blood or urine it would render the diagnosis of cholelithiasis more probable.

The method suggested by Dr. Hamel (*Medical Press*, October 15, 1902), Assistant of the Berlin Medical Clinic of the late Professor Gerhardt, promises to be of considerable practical value. In suspicious cases, he advises an examination of the blood-serum of the patient. He fills a small capillary tube with blood from a puncture in the lobe of the ear, and seals it at both ends. After standing for a few hours in a vertical position the serum separates from the blood-clot, and then can be examined against the light. Normal serum is colourless, whereas the slightest trace of bile is revealed by a yellowish tint, varying in depth with the degree of saturation. This simple test should be useful in determining



many obscure points in the action of bile-poisoning upon the human system, especially when the bile exists in minute quantities in the circulation.

The identification of bile-pigments in the urine is also a clinical detail of considerable importance. The reaction usually employed—that introduced by Gmelin—is open to the objection that on the addition of the acid to albuminous urine the precipitate of albumin obscures the play of colours. Moreover, should the urine under examination contain indican, the resulting blue coloration, in association with the yellow tint of the urine, gives a green tinge calculated to mislead. Heller's reaction, on the other hand, is not very well marked, and entails the use of chloroform, which complicates the procedure. Dr. Baudouin, of Tours (*Medical Press*, December 10, 1902), has introduced a reaction which, from the point of view of simplicity and precision, appears to possess certain advantages over those in common use. He employs a solution of fuchsine ( $\frac{1}{2}$  per cent.). If 2 or 3 drops of the fuchsine solution be introduced into urine containing bile, it immediately develops a fine orange tint, in marked contrast with the violet-red of the test solution. No other colouring matter of urine provokes this reaction, which is determined by very minute proportions of bile-pigment.

Dr. J. W. Duncan (*British Medical Journal*, February 14, 1903) says the methylene blue test for bile-pigment, noticed in the *British Medical Journal* for October 25, 1902, seems fairly reliable and very speedy. The methyl colours also give reactions. Methyl blue and methyl violet give each a red. Paul's test—a solution of methyl-aniline violet—gives a red. Loeffler's blue solution, containing methylene blue, gives a green. It is likely that the homologues of these colours also give reactions. The green with Loeffler's blue can be made to vanish on heating and reappear on cooling. Carbol fuchsin, 1 part, Loeffler's blue solution and dilute hydrobromic acid, each 2 parts, heated to boiling and cooled, give a blue. A few drops of this to 2 inches of urine in a test-tube give green in jaundice cases and blue in others. Heating the top of the liquid causes vanishing of green and

blue, while a fuchsin colour comes in. On cooling, the green or the blue comes back.

Another test—a 'ring' test—is as follows: Take 2 inches of urine in a test-tube, and shake with 20 drops of dilute hydrobromic acid, and then run on the top about  $\frac{1}{2}$  inch of spirit of nitrous ether. A green ring is seen at the junction of the fluids. Shaking the fluids together gives a green throughout. Another is got by adding a drop or two of old sodium nitroprusside solution to Ehrlich's bile-pigment test, when a dirty coffee-brown is got.

The so-called diagnostic operations of sounding for gall-stones and aspiration of a distended gall-bladder are not only futile, but dangerous; a small exploratory incision is safer and far better, whether for information or treatment.

The diagnosis of gall-stones by means of the Röntgen rays has not led to any constant or even promising results, except in the case of those concretions containing lime salts.

The following account from the *Berlin Klin. Woch.*, May 13, 1902, p. 513 (reproduced in the *Medical Review*, p. 460, to the editor of which I am indebted for permission to copy the plates), shows that the method may, however, be occasionally useful.

Oberst and others have doubted the possibility of taking skiagrams of gall-stones. Professor Beck has employed the Röntgen rays in ninety-seven cases of suspected biliary calculi, and found slight indications of their presence in only two, although in thirteen their existence was afterwards ascertained by cholecystotomy. Subsequent attempts have, however, been more successful. In each case several skiagrams should be taken, in order to determine the most suitable length of exposure. The longer the exposure, the clearer the outlines of the liver and the fainter those of the calculi. A long exposure of ten minutes should be tried first, then a short one of about five minutes. The tubes employed should be capable of conducting large quantities of electricity, and should have a high penetrating power. As a general rule, a tube which, with a 16-inch spark, casts a grayish-black shadow of the carpal end of the radius, and makes the soft parts appear almost transparent, is suitable. A very 'hard'

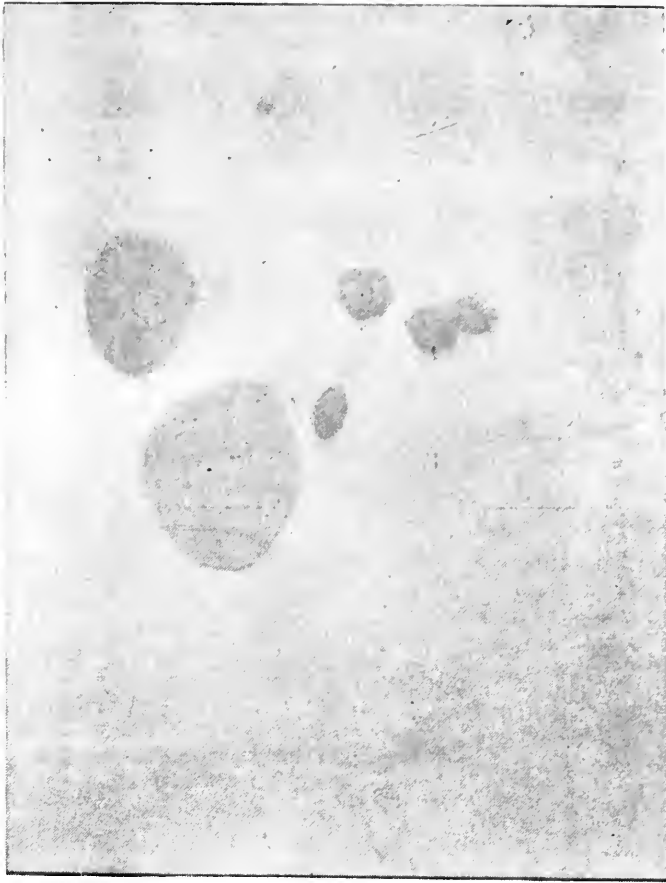


FIG. 61.--GALL-STONES IN SITU.



FIG. 62.--VARIOUS TYPES OF GALL-STONES.



PLATE XXXI.

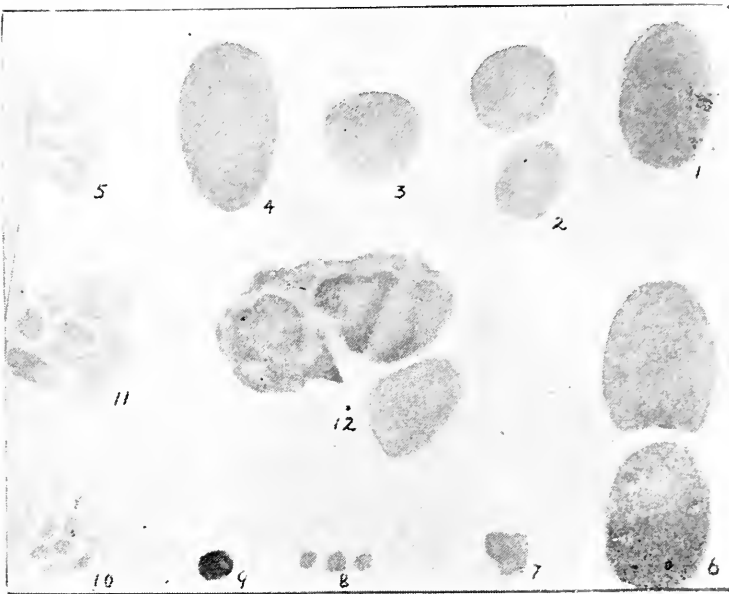


FIG. 63.—SKIAGRAM OF GALL-STONES.

*To face p. 236.]*



—*i.e.*, highly evacuated—tube emits rays which completely penetrate the calculi and cast no shadow. The intestine should be previously emptied, and the patient should lie face downwards with a cushion under the clavicular region, in order to render the gall-bladder as prominent as possible. The rays should strike the body obliquely at an angle of 45 to 55 degrees, although this magnifies the stones somewhat. With these technical precautions Professor Beck has repeatedly obtained clear skiagrams of biliary calculi. A negative result does not exclude gall-stones, even after repeated applications of the rays, but a positive one confirms the diagnosis. Fig. 61 is a reproduction of a skiagram showing gall-stones *in situ* in a man aged thirty-seven. There are two large calculi in the gall-bladder; the small, non-faceted stone probably lies in the cystic duct, and the three with facets are in the intrahepatic ducts. After cholecystotomy, however carefully the gall-bladder and bile passages are explored and the calculi are removed, a few small stones frequently appear later. This skiagram explains this fact, and at the same time proves that the operation of cholecystotomy is preferable to that of cystendysis with immediate closure of the gall-bladder.

Professor Beck has found that the chemical composition of the various gall-stones greatly influences their demonstrability by skiagraphy. He placed a number of calculi collected from different patients under the abdomen of an adult while lying face downwards and then applied the rays.

(1) Common gall-stones (Figs. 62 and 63, No. 5) consist of a hard shell with a soft nucleus, and the possibility of finding them with the Röntgen rays depends on the thickness of the external layer. (2) Pure cholesterin stones (Figs. 62 and 63, No. 2) give more marked shadows. Lamellated cholesterin stones have a crystalline centre of pure cholesterin, with a green or colourless surface composed of bilirubin and biliverdin combined with chalk. In the green layers carbonate of calcium is present, and such stones are readily detected. (3) Stones composed of bilirubin chalk with a small nucleus of cholesterin are generally solitary or occur in pairs. They cast very dark shadows (Figs. 62 and 63, No. 6). (4) Stones

of pure bilirubin or bilihumin with chalk are very rare, but easily demonstrable (Figs. 62 and 63, No. 9). They are gray or black, and have a metallic lustre. (5) Small stones of pure amorphous or crystalline cholesterin are rare. They somewhat resemble pearls, have a small nucleus of chalk or bilirubin, and cast fairly distinct shadows. (6) Stones composed of chalk, whether combined with carbonic acid or bilirubin, are very hard, and cast very dark shadows.

The **treatment** of gall-stones may be considered under the heads preventive, palliative, and radical. The first two resolve themselves into medical, the last into surgical, treatment.

### **Medical Treatment.**

The preventive treatment of cholelithiasis is chiefly a matter of attention to diet, exercise, and general hygienic surroundings. As women suffer from gall-stones much more frequently than men, it has been thought that their mode of dress, especially the wearing of stays, may be one of the causes; but probably the want of sufficient exercise, with constipation and rich living, its frequent concomitants, is more to blame. In prescribing prophylactic measures one would recommend rational clothing (which, of course, includes the avoidance of tight-lacing), temperance in diet, warm baths, fresh air, and regular exercise. In regard to diet, more depends on temperance than on the choice or refusal of certain foods. In giving directions on diet, patients may with advantage be told to avoid overindulgence in sweet and starchy foods and in rich dishes, which tend to induce dyspepsia. Alcohol should only be taken in moderation, well diluted, and with food.

In accordance with views expressed in considering the causation of gall-stones, either a sufficiency of albuminous food in the shape of meat or game, or farinaceous foods containing a fair proportion of nitrogen, should be taken. If there is any benefit to be obtained by the administration of olive oil, the use of butter or of animal fats, taken in quantities short of producing dyspepsia, should have a similar effect. Sir Lauder Brunton gives some valuable hints on treatment, and shows how the system of dieting adopted at certain



watering-places, when combined with exercise and the administration of certain diluent beverages (water being the essential element), has very beneficial results. It is a very good plan to recommend patients suffering from cholelithiasis to drink a tumblerful of the natural Carlsbad water with a little hot water before breakfast, and a tumblerful of simple hot water before the later meals; for there can be little doubt that, as a rule, too little water is taken, and the inspissated or stagnant bile and mucous, if not removed, will tend in the long-run to form concretions, just as drains, if not flushed from time to time, will become blocked by the deposition of solid matter.

Alkaline saline waters (particularly Carlsbad water taken hot before breakfast) act beneficially by stimulating the peristalsis of the digestive tract, and so increasing the flow of blood to the abdominal organs. In the peristalsis the bile passages participate, and the movement of the bowel acts as a form of massage, while the diseased mucous membrane benefits by the increased flow of blood. The injection of large quantities of hot water into the rectum serves the same purpose.

When gall-stones have once formed, no medicine, so far as we know, can dissolve them or produce any material benefit except by way of palliation. Although numerous remedies have been vaunted as beneficial in the dissolution of gall-stones, their advocates have argued as if the stones were in a test-tube, forgetting, apparently, that no drug can reach the concretions save by a very circuitous route and in an extremely diluted form; thus, benzoic acid, benzoate of soda, salicylic acid, turpentine, ether, chloroform, and numerous other agents reported to be beneficial, can really have no material effect. We would not for a moment say, however, that rational medical treatment may not relieve the catarrh of the gall-bladder or bile-ducts generally associated with gall-stones when they are producing symptoms, and restrict the increase of gall-stones already formed, or prevent the formation of new ones, and thus prove really curative if the patient have the good fortune to part with those already formed.

The experiments of Dr. Brockbank effectually dispose

of the supposition that the so-called saline cholagogues have any solvent action on gall-stones ; for, after allowing concretions to stand in a 1 per cent. solution of the various salts for fourteen days and then weighing them, he found that there had been no loss of weight. Among the drugs thus experimented on were the salicylate, the sulphate, the benzoate, the phosphate, the bicarbonate, and the chloride of soda, sulphate of potash, and chloride of ammonium.

Similar experiments with olive oil, oleic acid, and a solution of *sapo animalis* yielded far different results. A gall-stone placed in pure olive oil lost 68 per cent. of its original weight in two days, and then broke up into small pieces. With pure oleic acid a similar result followed in a much shorter space of time, a small gall-stone disappearing in twenty-four hours, and a larger one, after losing 63 per cent. of its weight in two days, broke up into small fragments in four days. The effect of a solution of animal soap on the concretion is remarkable : after standing for a few hours in a 5 per cent. solution a gall-stone becomes coated with a bluish-white, filmy material, and in time the solid matter becomes viscid. In view of the fact that the administration of olive oil is said to have a curative effect in cholelithiasis, these experiments are interesting ; but, as there is not the slightest evidence that the oil can reach the gall-stone in the gall-bladder or cystic duct, there must be some other than direct solvent action to explain the beneficial effect—indeed, that such an effect takes place is doubted by some observers, and requires more direct proof before it can be accepted.

An explanation of what occurs is offered by Dr. Brockbank in his book ('On Gall-stones,' E. M. Brockbank ; London, 1896) : 'Another explanation of the reported disappearance of the gall-stones after large doses of oil may be derived from the action of soap and fats on cholesterin. A digested fat passes into the circulation from the alimentary canal in three forms—as unchangeable fat, as the corresponding fatty acid, and as soap. All occur normally in the bile, and the amount present in the bile increases with the amount of fat taken in the diet. Oil, fatty acids, and soaps all dissolve cholesterin readily, and break up a gall-stone. If, then, the oil, fatty

acid, and soap appear in the bile in increased amount after large doses of oil, it is very probable that the gall-stone is attacked by them, especially by the soap, and in time is dissolved or so reduced in bulk as to be enabled to pass out into the duodenum.'

We have tried olive oil in large doses in many cases, and cannot say that we have seen much good to result from its employment, unless, perhaps, in one case of impacted calculi in the common duct, where an operation was performed after the olive-oil treatment had been tried for some weeks. The gall-stones were then found to yield more readily than usual to the pressure of the finger and thumb, as if the treatment had lessened their consistency.

The oil may be administered either by the mouth or by the rectum; in either case from 3 to 10 ounces should be given daily. It is not readily taken except with food, and even then it is apt to give rise to dyspepsia.

Dr. Goodhart (*British Medical Journal*, January 30, 1892) gives an account of five cases of probable cholelithiasis in which olive oil had been administered with apparent benefit. He remarks: 'With reference to the results, I wish to say that it is obvious that I cannot claim for these cases anything more than a suspicion in favour of the value of the administration of oil. In no one of the cases have gall-stones been proved to have passed, and in none of the cases has improvement been so immediate that effect and cause certainly go together.'

Dr. Kishkin's experiments appear to show how a mistaken idea of its good effects has arisen. The supposed calculi which were parted with were found to consist of oleic, palmitic, and margaric acids combined with lime, and similar concretions could be produced at any time by giving olive oil to any persons suffering from scanty biliary secretion. No true gall-stones were ever found in the motions after the olive-oil treatment.

The administration of eunatrol (oleate of soda) in the form of pill has appeared to do good in some cases that either declined or were unfit for operation. The action of eunatrol is, we presume, like that of olive oil.

Belladonna has been said to have a specific action in cholelithiasis, and it is readily conceivable that, if a small concretion were passing along the ducts, by its specific action on involuntary muscular fibre this drug might aid in its expulsion. But we cannot agree with a medical writer who says that a pill containing  $\frac{1}{4}$  grain of extract of belladonna and  $\frac{1}{4}$  grain of podophyllin resin is a remedy as nearly approaching a specific as it is possible to obtain.

Massage found a strong advocate in the late Dr. George Harley, who said: 'For, without doubt, perseverance and opportunity will in the end enable them (the operators) to discover gall-bladders equally as readily as the trained fingers of the expert do, and that, too, even through abdominal parietes so thick that the untrained hands cannot do so much as make out the boundary of the solid liver through them. While, again, they will ultimately find that they will be able to extrude small impacted biliary concretions, be they in the shape of sand, gravel, or stones, from the bile-ducts into the duodenum with as much safety and certainty as they can pass a catheter through a stricture into a human urinary bladder. At the same time, for the sake of the patient's welfare as well as their own reputation, they must never forget to be as careful in the mode of operative procedure in the one case as in the other, as neither operation is invariably unattended with danger. This is especially the case when the manipulative operation has been unfortunately delayed till the gall-stones have grown large and hard, and, on account of the prolonged pressure, begun to ulcerate through the tissues they have long pressed against.'

It is scarcely necessary to do more than draw attention to the description of the gall-stones at the beginning of this chapter and to the many changes frequently present in the gall-bladder and bile-ducts, in order to point out how futile—nay, more, how injurious—massage must be in many cases, however skilfully performed; for not only is it unlikely, but in by far the greater number of cases it is utterly impossible that the concretions can be forced through passages so narrow as we know the cystic and common ducts to be.

We can only say that were we the subjects of cholelithiasis we would not submit to massage, nor could we conscientiously recommend it to others. Although it may aid the expulsion of small calculi, it is impossible to diagnose the absence of large ones or to know the exact condition of the ducts, which may possibly be ruptured by manipulation.

During a gall-stone attack relief is urgently demanded. At times the drinking of a pint of water as hot as it can be taken, especially if combined with the application of hot fomentations over the region of the liver, will assuage the pain; at other times the administration of 30 drops of spiritus etheris in  $\frac{1}{2}$  ounce of chloroform-water every quarter of an hour for three or four doses will answer the same purpose. In some cases aspirin in 5 or 10 grain doses, and repeated in an hour or two if required, may prove of service. In many cases, however, the only satisfactory remedy is a morphia injection.

### Surgical Treatment.

After medical treatment has been fairly and fully tried and failed, all are now agreed that surgical measures should be resorted to.

While cholecystotomy is generally recognised as the operation to be aimed at in the treatment of affections of the gall-bladder or bile-ducts, especially in cholelithiasis, it is often impossible to say what operation will have to be done until the abdomen is opened.

The indications for operating would seem to be as follows:

1. In frequently recurring biliary colic without jaundice, with or without enlargement of the gall-bladder.
2. In enlargement of the gall-bladder without jaundice, even if unaccompanied by great pain.
3. In persistent jaundice ushered in by pain, and where recurring pains, with or without ague-like paroxysms, render it probable that the cause is gall-stones in the common duct.
4. In empyema of the gall-bladder.
5. In peritonitis, starting in the right hypochondrium.

6. In abscess around the gall-bladder or bile-ducts, whether in the liver or under or over it.

7. In some cases where, although gall-stones may have passed, adhesions remain and prove a source of pain and illness.

8. In fistula discharging mucus or muco-pus.

9. In certain cases of chronic jaundice with distended gall-bladder dependent on some obstruction in the common duct, although the suspicion of malignancy be entertained. In such cases the increased risk must be borne in mind, as malignant disease may be the cause of the obstruction, and operation in such cases is attended with greater danger than ordinary.

10. In phlegmonous cholecystitis and in gangrene, if the case be seen and recognised at a sufficiently early stage of the disease.

11. In gunshot injury or in stab-wound over the region of the gall-bladder.

12. In suspected rupture of the gall-bladder without external wound.

13. In some cases of chronic catarrh of the gall-bladder or bile-ducts.

14. In infective and in suppurative cholangitis.

15. In certain solid tumours of the gall-bladder where there is no evidence of secondary growths in the liver.

16. In certain cases of biliary fistula if it be thought that the cause of obstruction may possibly be removed.

17. In acute, subacute, or chronic pancreatitis due to gall-stone obstruction and secondary infection.

### **Diagnostic Operations.**

Of the operative measures undertaken for diagnosis, sounding and aspiration of the gall-bladder must be referred to. The so-called 'sounding for gall-stones,' either by means of a probe passed through a cannula, or by the fine needle of an aspirator, is both uncertain and dangerous, and may more safely be replaced by a small exploratory incision, which can be extended for treatment if required. If the patient be

thought too feeble to bear a general anæsthetic, this operation may be done under cocaine.

Aspiration of a distended gall-bladder through the unopened abdomen, though apparently a simple procedure, is not unattended with danger, death having followed in more than one instance. Murphy says it is fatal in 25 per cent. It is only in very exceptional cases that it can do any good.

It is infinitely preferable to make a small exploratory incision, then to empty the gall-bladder by the aspirator, and afterwards to explore the bile passages with the fingers. If, however, aspiration without exploration be decided on, a small needle should be used, and the cyst emptied as far as possible, in order that intracystic tension may not lead to extravasation through the needle puncture.

#### **General Considerations bearing on Operations on the Gall-bladder and Bile-ducts.**

While cholecystotomy is generally recognised as the operation to be aimed at in the treatment of affections of the gall-bladder and bile-ducts, it is often impossible to say what operation will have to be done until the abdomen is opened and the exact state of affairs made out, for a contracted or dilated gall-bladder, a suppurating or merely a distended viscus, concretions in the gall-bladder or cystic or common ducts, the condition of the surrounding organs, the presence or absence of adhesions, and a host of other conditions, will all influence the subsequent action of the surgeon, who always begins the operation as an exploratory one, the subsequent steps depending on the nature of the disease.

No surgeon should attempt the removal of gall-stones unless he is prepared for any of the various operations on the biliary passages, such as choledochotomy or cholecystectomy, as it is almost impossible to say beforehand what may be required until the ducts have been explored by the fingers and the condition of the affected viscera ascertained; no operation should, as a rule, be concluded until it is clearly made out that the ducts, including the hepatic and common, are quite free from concretions, otherwise disappointment and dissatisfaction are

certain to follow. Since in the majority of cases, then, an operation for gall-stones is in the first place simply exploratory, the actual operation on the gall-bladder or bile-ducts being only determined by the condition found when the abdomen is opened, it may be well for us first to consider a simple abdominal section in the gall-bladder region.

### **Preparation for Operation.**

It may be convenient here, before considering the operation itself, to give some of the details carried out in my operative work generally, especially as they apply to the operations about to be described.

First, as to the room in which the operation has to be performed. Any ordinary, well-cleaned room, having high windows so as to give good top light, answers almost as well as an operating theatre. There is, of course, an advantage in having electric light, but, as I shall show, the operation I now perform on the bile passages is done close to the surface with few exceptions, not as formerly at a great depth, which necessitated a special electric lamp, and always a very good vertical or high oblique light.

The advantage of operating in a hospital or surgical home is that the surgeon, or his house-surgeon or assistant, is responsible not only for the operation, but also for the after-attendance, a matter almost as important as the operation itself. Moreover, the surgeon can do his work better, and with greater confidence, where he is accustomed to operate, and where he is confident that all his directions, before, at the time, and subsequently, will be carried out to the letter.

In this matter of where the operation should be done, the surgeon who has to do the operation ought to make the selection, and the patient should abide by the decision with the full confidence that the operator will select the place where he can do his work to the best advantage of the patient.

I have seen several unsatisfactory cases in which patients insisted on having operations performed in their own homes,



which were utterly unsuitable for such a purpose. These cases would in all probability have done well had they been in a surgical home, where the complications causing the trouble could have had immediate and skilful attention.

The surgeon ought also to be helped by his ordinary assistant in all serious operations such as I am about to describe, for a stranger, no matter how skilful, can never accommodate himself immediately to the needs of the operator, and it must be remembered that surgery is a fine art that can only be carried out with the greatest perfection under circumstances that are favourable to the artist.

The selection of the anæsthetist should also be with the operator, for with a competent anæsthetist the surgeon can devote the whole of his mind to his own part of the work in

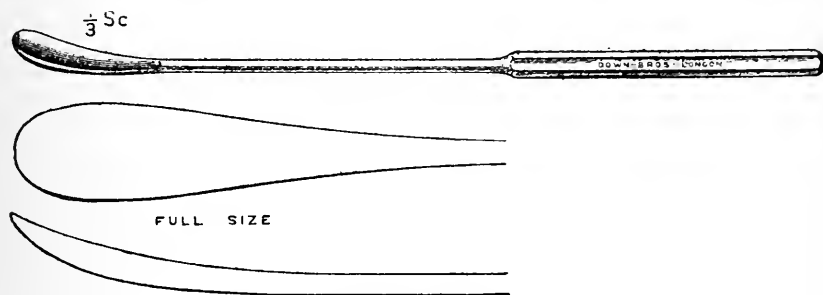


FIG. 64.—GALL-STONE SCOOP.

hand, without having his attention diverted to make suggestions concerning the anæsthetic.

With regard to instruments, a gall-stone scoop is the only special appliance I employ, and all the instruments are boiled for half an hour before being used.

My sutures and ligatures are of formalin catgut prepared by the xylol process, which I described in the *British Medical Journal* of September 27, p. 974. No. 'oo' size is used for ligatures, and No. 'o' size for sutures; they are strong and reliably aseptic. Since the introduction of celluloid thread, I have given up the use of silk for sutures, as the former is much stronger, ties with a very firm knot, and is easily sterilized by boiling. As it is not absorbable, I only employ it for the outer or serous suture in stitching the incision in the duct in choledochotomy, and for this purpose the 'oo' green chromic catgut prepared by the xylol process answers

equally well, as it does not become absorbed before the second or third week. As showing the disadvantage of non-absorbable sutures, a case came under my notice in which a silk suture used in a choledochotomy formed the nucleus of another gall-stone, which fortunately passed without further operation.

As sponges I employ sterilized gauze swabs, but for keeping the viscera out of the way I use flat marine sponges, than which I find nothing to answer so well. The area of operation is surrounded by dry sterilized towels, sterilized by dry, superheated steam for half an hour.

My assistant, dressers, and nurses all wear boiled rubber gloves, though personally I do not, unless I have just had a septic case to operate on, as I find they impair my sense of touch and cause some delay; but I take especial care to scrub and wash several times before operating, and near the operating table I keep a bowl of 1 in 2,000 mercury biniodide solution, in order to lave my hands from time to time during the course of the operation. The instruments are used out of a 1 in 40 absolute phenol solution, and the sponges out of 1 in 2,000 biniodide solution, but they are wrung quite dry before being used. Doubtless an ordinary saline solution would answer equally well for instruments and sponges, but I think not for the hands. The ligatures are used out of a 1 in 40 phenol solution in spirit, in which they are also stored.

The patient is prepared by having an aperient given, so as to secure the bowels being moved the day before operation, and an enema is given the evening before, if the operation is to take place early the next morning. If there is any feebleness of pulse, 5 minims of liq. strychnia are given subcutaneously on the afternoon and evening of the day before operation, and 10 minims as soon as the operation has begun. Should there be chronic jaundice or a tendency to hæmorrhage, calcium chloride is given; for although there is a greater tendency to bleeding in chronic jaundice from pancreatic disease than when jaundice is due to gall-stone obstruction, I think there can be no doubt that in all cholæmic conditions the blood becomes so altered that the coagulability becomes seriously diminished, and these factors demand

serious attention before any operation is undertaken in cases of common duct cholelithiasis.

The skin of the patient over the operation area is prepared the day before by thoroughly washing with soft soap, or some soap, not necessarily antiseptic, that will give a good lather; if needful, shaving is then done, and the whole area is gently rubbed with benzine. A dressing of lint, wet with 1 in 40 carbolic solution in water, is then applied, and over this oil-skin or gutta-percha tissue. The dressing is changed early the next morning, and the skin is thoroughly washed, so as to clear away all loose and sodden epithelium, after which another 1 in 40 dressing is applied, to be removed on the operating-table.

If the patient is feeble, a pint of normal saline solution with an ounce of brandy is given a short time before the operation. As shock is intensified by exposure to cold, my patients are always enveloped in cotton-wool, which is conveniently done by making a suit of gamgee tissue, that can be readily run together by the nurses in an hour or two the day before operation. When operating in a theatre I employ a heated table, but elsewhere indiarubber hot-water bottles around the patient take its place. It will be found that a firm sand-bag about 18 inches long by 6 inches wide and  $3\frac{1}{2}$  inches deep, covered with flannel, and placed on the operating-table at the liver level, will push the spine forward, and with it the liver and bile-ducts, so that the common and hepatic ducts are brought several inches nearer to the surface. By opening out the costal angle and tending to make the intestines slip down from the liver, it acts like the Trendelenburg position in pelvic surgery.

Though this method, until I drew attention to it, does not seem to have been employed by others, I can, from ample experience, speak well of its great utility.

### Operation.

Whereas I used formerly to make a vertical incision through the linea semilunaris, I now always make my incision over the middle of the right rectus in a line parallel with its fibres, which are then separated by the finger, the pos-

terior sheath of the rectus and peritoneum being divided together. Where the gall-bladder is distended and there is no jaundice, a small incision of 2 or 3 inches only may be required; but when it is necessary to explore either the hepatic, common, or deeper part of the cystic duct, instead of prolonging the incision downwards, as was formerly done, I now carry it upwards in the interval between the ensiform cartilage and the right costal margin as high as possible, thus exposing the upper surface of the liver very freely. It will be found that by lifting the lower border of the liver in bulk and rotating it (if needful, first drawing the organ downwards from under cover of the ribs), the whole of the gall-bladder and the cystic and common ducts are brought quite close to the surface; and as the gall-bladder is usually strong enough, my assistant can take hold of it with his fingers or forceps, and by gentle traction can keep the parts well exposed, at the same time that, by means of his left hand with a flat sponge under it, he retracts the left side of the wound and the viscera, which would otherwise fall over the common duct and impede the view.

It will now be observed that, instead of the gall-bladder and cystic duct making a considerable angle with the common duct, an almost straight passage is found from the fundus of the gall-bladder to the entrance of the bile-duct into the duodenum, and if adhesions have been thoroughly separated the surgeon has immediately under his eye the whole length of the ducts, with the head of the pancreas and the duodenum. So complete is the exposure that, if needful, the peritoneum can be incised over the free border of the lesser omentum, and the common duct separated from the hepatic artery and portal vein, but this is not necessary except where a growth or glands have to be excised. The surgeon, whose hands are both free, can now deal with the gall-bladder, cystic, common, or hepatic ducts quite easily; for example, with his left finger and thumb he can so manipulate the common or cystic duct as to render prominent any concretions, which can be directly cut down on, the edges of the opening in the duct being caught by pressure forceps. The assistant can now take hold of the forceps with his left hand,

as they with the sponge will form a sufficient retractor, since the duct is so near the surface. When the duct is incised there is usually a free flow of bile, which, it must be remembered, is probably infective; but by inserting a sponge in the kidney pouch, and rapidly mopping up the bile as it flows by means of sterilized gauze pads, any soiling of surrounding parts is avoided, and, if thought necessary, the bulk of the infected bile can be drawn off by the aspirator either from the gall-bladder or from the common duct above the obstruction before the incision into the bile passages is made.

After removing all obvious concretions, the fingers are passed behind the duodenum and along the course of the hepatic ducts, to feel if other gall-stones are hidden there; and when the common duct has been incised, a gall-stone scoop, the only special instrument I use, is passed into the primary division of the hepatic duct in the liver, and down to the duodenal orifice of the common bile-duct, and if thought necessary, to insure the opening into the duodenum being patent, a long probe is passed into the bowel.

The incision into the bile-duct, if one has been made, is now closed by an ordinary curved, round needle, held in the fingers without any needle-holder, a continuous catgut suture being used for the margins of the duct proper, and a continuous fine green catgut or spun celluloid thread being employed to close the peritoneal edges of the duct.

Where the gall-bladder is contracted and the pancreas is indurated and swollen from chronic pancreatitis, and likely to exert pressure for a time on the common duct, I insert a drainage-tube directly into the duct, passing it upwards into the hepatic duct, and closing the opening around it by a catgut stitch, which will hold for about a week; but where this is not done, and the size of the gall-bladder will permit it, I usually fix a drainage-tube into the fundus of the gall-bladder in the same way, as this drains away all infected bile, and avoids pressure on the newly-sutured opening in the duct.

So easy is it to remove impacted stones after this method of exposure that I now never spend a long time in manipulating stones impacted deeply even in the cystic duct, but at once incise the duct, remove the concretions, and close the

opening, without damaging the duct by much pressure and prolonged manipulation. It is just as easy to incise the hepatic duct where that is necessary or advisable. Although there is seldom any fear of leakage or infection, yet where the ducts have been incised and extensive adhesions separated, there is usually some tendency to pouring out of fluid in the first few hours. I therefore generally insert a gauze drain through a split drainage-tube, bringing it out by the side of the gall-bladder drain. This is usually removed within twenty-four hours.

The wound is closed by continuous catgut sutures, first to peritoneum and deep rectus sheath, and next to the anterior rectus sheath. Lastly, the skin margins are brought together by means of a few uninterrupted silkworm-gut sutures inserted quite an inch from the line of incision, and brought out an inch beyond the incision on the other side, so as to allow the edges to fall together without tension, thus securing union by first intention.

To those having little experience in these operations, the modifications I have employed may seem trivial, but to those who have experienced the difficulties of the ordinary operation of removing gall-stones from a contracted gall-bladder or from the cystic or common ducts, I feel sure the method I have described, which enables the whole of the bile passages to be dealt with as a straight tube close to the surface, will be sufficiently appreciated.

In these operations I employ forcipressure for the immediate arrest of hæmorrhage, but I find it is more satisfactory also to ligature all the bleeding-points, as in jaundiced cases the compressed and unligatured vessels are apt to bleed subsequently and to lead to complications that are avoidable by careful hæmostasis. For the same reason I prefer to divide and ligature firm visceral, especially hepatic, adhesions, where that is practicable, rather than, as formerly, to separate them with the finger or tear them through.

If the liver be slightly torn in separating adhesions, the bleeding must be carefully arrested before the abdomen is closed. Sponge pressure is usually sufficient if the laceration be small, and this may be made more efficient by using at

the same time a solution of adrenalin ; but, if the laceration be extensive, deep catgut sutures, applied by means of a round intestinal needle, will usually accomplish the desired effect ; or, this failing, gauze pressure, the plug being left in until it becomes loose, will be certain to answer.

Nothing can be simpler than an ordinary cholecystotomy with a distended gall-bladder, or even with a gall-bladder of ordinary size, where a small incision suffices to expose the sac, which is emptied by the aspirator. The collapsed sac is then brought through the wound and surrounded by sterilized gauze ; it is then incised through the point where the needle was inserted, and through the wound in the fundus the gall-stone scoop is inserted and all gall-stones are removed, a probe or the finger being employed to prove the ducts clear. A firm rubber tube, much firmer than the drainage-tubes ordinarily sold, is then inserted from  $\frac{1}{2}$  inch to 1 inch into the gall-bladder, the edges of the incision being drawn firmly around it by a catgut purse-string suture, which is tied and cut short, the drain being fixed in position by a catgut suture which transfixes the tube and the edges of the incision in the gall-bladder. The edges of the incision in the gall-bladder are then fixed to the aponeurosis by three or four catgut stitches, but never to the skin, unless a permanent biliary fistula is intended. This tube, which is sufficiently long to pass into a bottle by the side of the patient, drains all the bile away from the wound, and by the time the catgut has dissolved, the wound will have healed by first intention, except where the tube was, and that part heals by granulation within the next week or two if the ducts are clear.

The following is an example out of many, of a simple cholecystotomy :

Mrs. C., aged forty-one, was admitted to the Leeds Infirmary, March, 1899, on account of a tumour of the gall-bladder, noticed a month, but following on gall-stone symptoms of several years' duration.

On March 28, cholecystotomy was performed, and after several ounces of straw-coloured fluid mixed with pus had been withdrawn through an aspirator needle, the gall-bladder was opened, and fourteen faceted gall-stones were removed

from it and the cystic duct, the largest being the size of a small walnut, the smallest the size of a pea. Exploration within the duct by means of a long probe, and outside the duct by the finger in the abdomen, failed to discover any further obstruction. A drainage-tube was inserted into the gall-bladder and surrounded by a purse-string suture; the edges of the opening were then fixed by sutures to the aponeurosis. Bile appeared on the dressings on the following day, the drainage-tube was removed on the sixth and the sutures on the eighth day. No bile was discharged after the ninth, and the wound was perfectly healed on the thirteenth day after operation. The patient returned home on the seventeenth day. A simple operation like that just given is quite the exception, the gall-bladder being usually contracted and surrounded by adhesions; moreover, in these cases the obstruction will usually be found in the cystic or common ducts. The advantage of the complete operation that I have described, in which the edge of the liver is lifted up and the bile passages brought well under view, will be experienced in this class of cases.

**Management of Contracted Gall-bladder.**—The next question will be, How is the contracted gall-bladder to be dealt with? If it is too small to be brought to the parietes, but sufficiently large to admit a drainage-tube, the method of fixing the tube by purse-string suture just described will be quite safe, even if the opening in the gall-bladder has to be left 2 or 3 inches from the surface, for the omentum can be made to lie against the tube, and by the time that the catgut is dissolved a track of adhesions will have formed that will quite effectually prevent extravasation; but in order to make assurance doubly sure I frequently insert a small split drainage-tube with a little gauze in it, passing it quite down to the gall-bladder, and bringing it out by the side of the first tube.

*Isolation of a Drainage Track by Omentum and by Gauze.*—Mrs. N., aged fifty-seven, seen with Dr. H. Well till eight months ago. Never had spasms or jaundice previously. Six attacks in eight months. The pain, which is severe, begins at the epigastrium and passes to the right infrascapular region. Examination negative but for tenderness over gall-bladder.



*Operation, December 15, 1898.*—Very adherent dilated stomach, with contracted gall-bladder, containing thick mucus and gall-stones. Separation of adhesions and cholecystotomy performed, but as the gall-bladder could not be fixed to the parietes a tube was fixed in it and isolated by iodoform gauze. Good recovery; tube removed on ninth day. Patient has been quite well since recovering from the operation.

If the gall-bladder be so contracted as to be incapable of admitting a tube, it may either be closed by suture, the line of union being protected from hurtful leakage by a strip of gauze laid over it and brought to the surface through a rubber tube, or the contracted and useless remains of the gall-bladder may be removed by cholecystectomy.

Before adopting the method for complete exposure of the whole biliary passages, the shrivelled and useless gall-bladder was frequently left after clearing out its contents, with the result that relapse sometimes occurred and cholecystectomy had subsequently to be faced, as in the following case:

CASE 229.—*Cholecystotomy—Recurrence of Symptoms—Cholecystectomy—Recovery.*—Mr. A., aged fifty-six, seen with Dr. C. and Dr. A., of Nottingham, for loss of flesh, general ill-health, and frequently recurring pains in the right hypochondrium, the illness being of several years' standing.

*Cholecystotomy, September 4, 1898.*—Contracted gall-bladder with adhesions to the surrounding parts, the result of gall-stone irritation; cholecystotomy performed, the gall-bladder being isolated by a gauze drain. This was followed by relief for some months, when the painful attacks recurred, accompanied by rigors and slight catarrhal jaundice.

*Cholecystectomy.*—A further operation was advised, and on March 3, 1899, the shrivelled gall-bladder, containing muco-pus, was removed, a small tube being passed into and fixed in the cystic duct. Bile flowed freely the next day. Ultimately the patient made a complete recovery, and when seen in 1902 he was in robust health, and said he had had no further trouble.

This and other similar cases of contracted gall-bladder led me to adopt the operation of cholecystectomy more frequently

in certain cases, where to leave the gall-bladder means leaving a useless and diseased appendage lined with mucous membrane, that is certain to secrete mucus, which is apt to be retained owing to the cystic duct contracting and becoming strictured as the result of long-continued irritation and ulceration. This mucus, retained under tension, becomes infected, and a state of affairs much resembling chronic appendicitis is apt to continue until either the gall-bladder undergoes atrophy and absorption, a condition which may be termed *cholecystitis obliterans* (see p. 66), and which I have seen on several occasions, or the patient is worn out by repeated pain and chronic septicæmia, unless a further operation is undertaken to remove the offending organ. For a description of the operation of *cholecystectomy*, see p. 298.

If, as frequently happens, gall-stones are so firmly fixed in the cystic duct that they cannot be pressed backward into the gall-bladder, it is better not to use force, but to incise the duct over the stone, and, after clearing the duct, to close it by a double row of sutures to mucous membrane and serous coat respectively, as in the following case :

CASE 259.—*Empyema of Gall-bladder—Cystodochotomy and Drainage—Recovery.*—Mrs. G., aged forty-seven, seen with Dr. L., of Farsley. Repeated gall-stone seizures for two years ; no jaundice ; no fever ; distended and tender gall-bladder.

*Operation, March 23, 1899.*—*Empyema* of gall-cyst, with many small stones in gall-bladder ; one large impacted stone, which could not be dislodged from within, was removed from the cystic duct by direct incision ; drainage of gall-bladder and gauze drain down to sutured incision in duct. Good recovery. Well in 1901.

If the concretions are in the common duct, either fixed or floating, it is just as easy, with the duct well under the eye and near the surface, to incise it and remove the stones as it is to open the gall-bladder. All such instruments as handled needles and Halsted's hammer are quite unnecessary, for the incision in the duct can as readily be closed by means of a curved round needle (sewing-needle pattern) in the fingers as by any more complicated apparatus. But before closing the duct it is of the utmost importance to ascertain that there

are no stones left either in the ampulla of Vater or in the hepatic duct; and although the fingers manipulating the outside of the ducts can give information as to any large stones, it would be easy to overlook small ones unless the scoop is passed freely upwards into the hepatic ducts and downwards behind the duodenum, or, if necessary, the opening in the duct can be made sufficiently large to admit the finger for exploration.

I usually pass a large probe down into the duodenum through the papilla to be sure that the passage is quite free. In one case, not being able to pass the probe beyond the papilla, I opened the duodenum, and found a stricture of the common duct close to its termination, which I divided after freely laying the papilla open over a director (Case 436). For details and cases see Chapter XI., on Choledochotomy.

In quite a number of cases after the common duct has been cleared I have found stones in the hepatic ducts, which I have removed by the scoop or by direct incision of the hepatic duct (Cases 492, 508). If a stone is impacted in the duodenal end of the common duct it may sometimes be more easily reached through a vertical incision in the second part of the duodenum, when the concretions can be directly cut down on through the posterior wall of the duodenum, or the papilla can be laid open over a director; it is then easy to pass the gall-stone scoop up the common duct in order to be certain that it is free from concretions. All that is now necessary is to close the anterior duodenal wound by a continuous catgut suture for the mucous membrane and a continuous silk or celluloid thread for the serous margins (see p. 295, Duodenocholedochotomy).

The only cases in which I should now think it desirable to perform cholecystenterostomy are those in which the obstruction is a permanent one—for instance, in cancer of the head of the pancreas and growth or stricture of the common duct; but my experience of the operation in malignant disease has not been such as to lead me to strongly advise it (see Chapter XIII., p. 305, Cholecystenterostomy).

**Malignant Disease.**—Where gall-stones are associated with

cancer of the gall-bladder, liver, or pylorus, a much more extensive operation may have to be done, as in the cases reported on pp. 186-192).

**Intervisceral Fistula.**—In detaching adhesions it may be found that there is a fistula between the gall-bladder and stomach, pylorus or bowel, and a careful search must always be made for this, lest an opening into one of the hollow viscera be left, which would probably mean extravasation and death. The following are examples of intervisceral fistula :

CASE 219.—*Cholecystotomy and Closure of Fistula between Gall-Bladder and Stomach.*—Mrs. H., aged sixty, seen with Dr. C., of Doncaster. Attacks of gall-stone pain for fifteen months, lately very frequent, and followed by slight jaundice ; constant dyspepsia, with frequent vomiting and steady loss of flesh.

*Operation, July 7, 1898.*—The stomach was found firmly adherent to the gall-bladder, and on separating the adhesions a fistula between the gall-bladder and stomach was found. The edges of the stomach fistula were pared, and the opening was closed with two rows of sutures. Through the fistula in the gall-bladder the gall-stones were removed and drainage carried out. The patient made an excellent recovery, and is now in good health.

CASE 304.—*Closure of Fistula between Gall-bladder and Colon.*—Mr. G., aged fifty, seen with Dr. W. No previous history of spasms. First attack of gall-stone colic in October, 1897, followed by jaundice ; several seizures in December, 1897, with jaundice lasting two months and associated with ague-like seizures. Slight attacks for a year, and then one very severe in December, 1898, and again in January, 1899. During the whole period the icterus deepened after each attack, and occasionally rigors occurred ; lost over  $2\frac{1}{2}$  stones in weight ; jaundiced, but not deeply ; liver not enlarged ; no tumour of gall-bladder ; tenderness above and to right of umbilicus ; well-marked dilatation of stomach.

*Operation, January 28, 1900.*—Fistula between shrunken gall-bladder and colon discovered ; cystic duct shrunken. Cholecystectomy ; common duct dilated to size of small

intestine, and containing large floating gall-stone; calculus crushed, and fragments manipulated back through opening left by incision of cystic duct; tube introduced into common duct; fistulous opening into colon closed. Uninterrupted recovery.

**Gall-stones and Pyloric Stenosis.**—If with the gall-stones pyloric stenosis be found, then pyloroplasty or gastroenterostomy will have to be performed, as in the following cases :—

CASE 385.—*Cholecystotomy, Choledochotomy, Pyloroplasty.*—Miss T., aged forty-five, seen with Dr. W., of Harrogate. History of gall-stone attacks with slight jaundice for several years. History of gastric ulceration with stomach symptoms for two years; great loss of weight and strength; dilatation of stomach and tenderness over gall-bladder region, but no tumour.

*Operation, August 5, 1901.*—Pyloric stenosis with dilatation of stomach found together with gall-stones in gall-bladder and common duct; twenty gall-stones removed from gall-bladder by cholecystotomy, and two removed from common duct by choledochotomy. Pylorus treated by pyloroplasty. Smooth and rapid recovery. July, 1902, patient very well, and had gained over 2 stones in weight.

CASE 488.—*Cholecystotomy—Excision of Chronic Gastric Ulcer—Gastroenterostomy—Recovery.*—Mr. S., fifty-five years of age, who had suffered from indigestion for several years, began to have severe pain about an hour after food, and to lose flesh and look ill during the six months before I saw him. A doubtful tumour could be recognised, and during the attacks of pain the stomach could be felt to harden under the hand. Free HCl was present after a test meal. The serious nature of his ailment was brought home to the patient by his inability to continue his business, and on the advice of Dr. McGregor Young I saw him, and supported the opinion as to exploration. On operating, I found the swelling to be a greatly thickened pylorus, forming a distinct tumour, and that about  $1\frac{1}{2}$  inches from the pylorus along the lesser curvature was another tumour, which, from the enlargement of the glands, we suspected might be growth; but, on opening

the stomach, it was found that the pyloric swelling was an enormously hypertrophied sphincter, and that the stomach tumour was thickening around a chronic ulcer. The latter was freely excised by everting the portion of stomach involved and grasping it by means of the rubber-covered border of my gastroenterostomy clamps, which effectually controlled all bleeding. An elliptical incision was then made, so as to include the ulcer in its whole thickness and extent; after excision, the sides of the wound in the stomach where the ulcer had been were brought together by two continuous sutures, the first embracing the muscular coat and the second the mucous edges. When the clamps were removed there was no bleeding from the sutured wound. The stomach opening was closed, and a posterior gastroenterostomy was then performed. As the gall-bladder was full of thickened mucus and gall-stones, it was at the same time emptied and drained. A smooth recovery has been followed by restoration to health. Patient in good health November, 1903.

**Cholelithiasis and Enlargement of Pancreas.**—In common-duct cholelithiasis, especially where there is a small floating gall-stone, it is common to find the head of the pancreas enlarged and hard, the result of chronic pancreatitis. This will give rise to the suspicion of cancer of the head of the pancreas, and may lead to an unfavourable prognosis being given; but the following out of many cases that I have had shows that it is well to reserve our opinion in such cases, and to give the patient the hope of cure.

CASE 285.—*Enlargement of Head of Pancreas, suggesting Malignant Disease — Cholecystenterostomy — Recovery.* — On October 20, 1899, a lady, aged fifty-one, was seen with Dr. S., of Sunderland, who had been suffering for three years from attacks resembling those of gall-stones, each attack being followed by jaundice. During the past fourteen weeks the seizures had been more frequent and severe, and jaundice had never quite cleared away before another attack came. She had lost flesh and strength considerably, and had vomited from time to time between the attacks. Her digestion was much impaired, and there was a want of appetite. She had had rigors, but recently had only had slight fever at the time of

each seizure. The urine contained abundant lithates and a slight trace of albumin, but no sugar. On examination, the abdomen showed no manifest enlargement of the liver or gall-bladder, but some tenderness over the gall-bladder and at the epigastrium, where there was an indefinite sense of fulness.

*Operation, October 23.*—After detaching numerous adhesions, fifteen gall-stones were removed from the cystic ducts; but as a large nodular mass was occupying the head of the pancreas and partly obstructing the common duct, it was deemed advisable to perform cholecystenterostomy, so as to make a permanent opening between the fundus of the gall-bladder and the duodenum. The tumour gave the impression both to myself and to Dr. S. that it was malignant. Recovery was, however, uninterrupted; the button was passed on the tenth day; the wound healed by first intention, and the patient immediately began to put on flesh. She returned home, and has since been perfectly well in every respect. It is now over three years since the operation, and her health, I am informed, is perfect.

**Cholelithotrity.**—I have almost entirely given up cholelithotrity as a set operation, as, although in my earlier operations it answered well in some cases, in several the fragments did not pass, and gave further trouble or led to relapse. Moreover, the very complete exposure obtained by the operation I have described renders all uncertain methods, such as crushing, quite unnecessary.

### The After-Treatment.

I consider this almost as important as the operation itself. Expedition in operating is an important factor in lessening shock, especially in abdominal surgery, for it stands to reason that prolonged manipulation and exposure of the viscera in patients so ill, as the class of cases we are now considering must generally be, will be badly borne; as it is not only the work of the surgeon, but the deep anæsthesia that adds to the shock, since for these operations to be expeditiously performed the muscles must be well relaxed. Choledochotomy should occupy from half an hour to an hour, and only in case of unusual complications a little longer.

After operation 1 pint of saline fluid with 1 ounce of brandy is given by enema, and 5 minims of liq. strychniæ are given subcutaneously, this being repeated if called for. Subcutaneous injections of saline fluid or intravenous infusion are only rarely required.

Beyond teaspoonfuls of hot water or hot tea from time to time, all feeding is by the rectum for the first twenty-four hours, though if there is no vomiting the teaspoonful of water is increased to a tablespoonful, or even two, every hour. After forty-eight hours, if there is no vomiting, milk and soda and barley-water can be freely given. A little plasmon dissolved in the tea or beef-tea or barley-water considerably adds to the nutritive value of the fluid. Light custard pudding is usually given on the fourth day, fish on the fifth, and chicken on the sixth, after which the diet becomes almost normal.

The bowels are not disturbed before the fifth or sixth day, and then only by enema, unless there is vomiting or distension, and in case of either of these complications 1 grain of calomel is administered, and followed by 2 ounces of apenta water every two hours until it acts or until flatus passes freely, this being at times helped by the rectal tube or by turpentine enema.

Morphine is avoided after all my abdominal operations, as it tends to paralyze the intestines and leads to an accumulation of flatus. I believe that abstention from the use of morphine is a great feature in the success of abdominal surgery, just as I feel sure that in the past it has killed many patients who would otherwise have done well.

If a sedative is needed, 10 grains of aspirin will be found useful, and this can be repeated in two hours if required. In case of vomiting being troublesome or epigastric distension persisting, gastric lavage will be found useful, and when the stomach is emptied, a dose of apenta water may be left in it to incite peristalsis. Under the circumstances no food or fluid is allowed by the mouth, but plenty of fluid in the shape of normal saline is given by the rectum.

As a rule, recovery is uneventful, and, for the most part, after-treatment is negative. The stitches are removed on the



eighth day, and the tube usually comes away about the same time; the wound generally will have healed by first intention, and the spot where the tube was heals by granulation. The dressings are of the simplest, sterilized gauze and sterilized wool being employed as a rule, double cyanide gauze just boiled being sometimes used next to the wound.

The chief lessons we have to teach are that we should operate earlier, before serious complications have ensued, and that when we do operate we should be thorough, expeditious, and careful.

### **Further Details concerning Operations on the Biliary Passages.**

Having considered operations on the gall-bladder and bile-ducts as a whole, we may now review various points in the technique of the various operations in detail.

**Position of Patient.**—It has been proposed to suspend the upper part of the trunk when the patient is on the operating-table by straps placed under the arm-pits, in order to allow the intestines to fall away from the liver, and thus to afford a better view of the parts to be operated on, just as the Trendelenburg position does in the case of the pelvic organs; but this is both inconvenient and impracticable, and the same, or even a better effect can be obtained by the employment of a narrow, firm sand-bag, as described on p. 249.

**The Incision.**—I now always make my incision over the middle of the right rectus in a line parallel with its fibres, as described on p. 249, and illustrated on p. 264.

Kocher employs an oblique incision parallel to the right costal margin, which of necessity divides muscles and nerves, but which exposes the parts freely, as the wound at once gapes widely.

Mr. Rutherford Morison also advocates the oblique incision, which he extends very freely when the common duct has to be exposed. Our objections to the oblique incision are the necessarily extensive division of muscles, vessels, and nerves, and the difficulty of securing exact apposition subsequently, thus leaving a weak scar, with a tendency to ventral hernia.

The lumbar incision, which has been suggested in order to reach the common duct without opening the peritoneum,

is useful only in theory, and is surrounded by so many difficulties as to make it quite impracticable as an ordinary procedure.

**Arrest of Hæmorrhage.**—As a rule, pressure forceps and an occasional ligature effect all that is desirable or necessary ; but in cases of long-standing jaundice, especially if accompanied by malignant disease, additional precautions are advisable on account of the tendency to hæmorrhage. Cases 11, 354, 516, in the appendix are good examples.

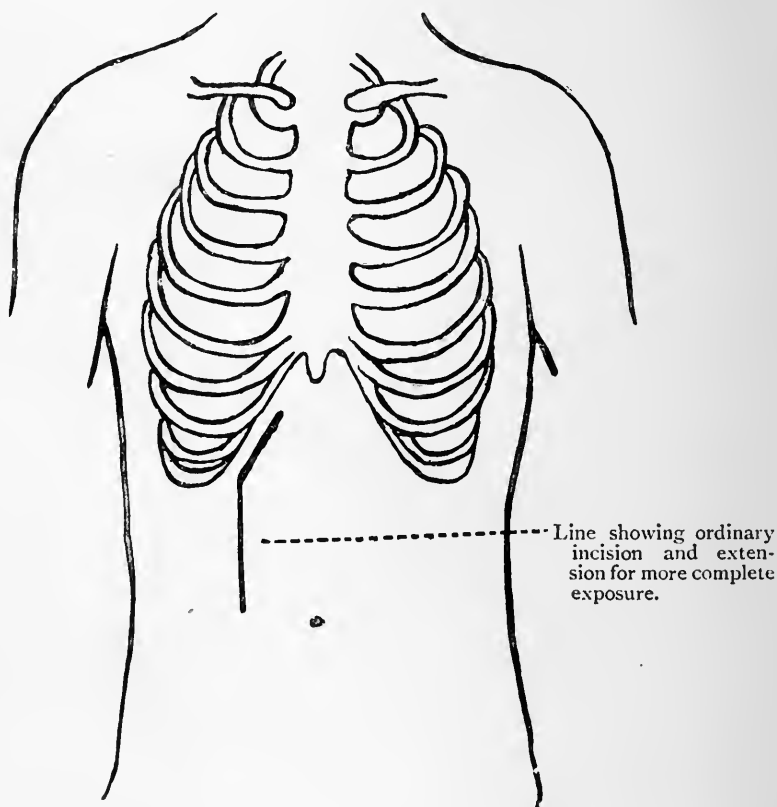


FIG. 65.—DIAGRAM TO SHOW INCISION.

The following cases, taken from a paper by Dr. Osler (*American Medicine*, April 27, 1902), and coming under his care within a few months, show how serious the hæmorrhagic condition is :

‘1. A woman, admitted on January 9 ; jaundice of four months’ duration ; recurring attacks of pain ; blood coagulation time, ten minutes. The condition was very serious, and

the pain was so severe that an exploratory operation was performed on January 29. Carcinoma of the gall-bladder and of the liver was found. She bled profusely during the night following the operation, and continued to bleed until death (on February 1).

‘2. A woman, admitted January 30; jaundice of four months’ duration, with recurring intermittent fever, associated with stones in the common duct; blood coagulation time on admission, eight minutes, gradually reduced by the use of calcium chloride to three and a quarter minutes.

‘*Operation, March 5.*—Numerous gall-stones in gall-bladder and in common duct. Hæmorrhage the day after operation, with the formation of hæmatoma, March 9; very severe bleeding with collapse; gradual recovery.

‘3. A woman, admitted on February 19, with a remarkable jaundice of nearly ten years’ duration. She had had recurring attacks of hæmorrhage, chiefly from the nose and from the uterus, in two of which she nearly died. She was admitted, pulseless and blanched, in the third attack. The hæmoglobin was 20 per cent., the red blood corpuscles were 1,600,000. Both she and the previous patient had multiple xanthoma. Coagulation time on admission, fourteen minutes; a month later it was four and half minutes, and her blood corpuscles had risen to 4,000,000 per cubic millimetre. On March 22, she had a little epistaxis and a few spots of hæmorrhage in the skin. Considering the remarkable tendency to hæmorrhage even when her coagulation time was at four minutes, that her general condition was good, and that she seemed to be accustomed in an extraordinary way to the persistent jaundice, operation was not advised.

‘4. A stout, healthy-looking woman was admitted on February 19, with pain, nausea, vomiting, and jaundice of four weeks’ duration. She had a good deal of vomiting while in the ward. The blood coagulation time was three and a half minutes. The nature of the case was doubtful, and she was transferred to the surgical side. The day before operation she became collapsed, had hæmatemesis, and died. The necropsy showed gall-stones, cancer of the neck of the gall-bladder, extensive hæmorrhage into the lesser peritoneum and

about the tail of the pancreas, and hæmorrhage into the stomach.

‘5. A man was admitted who had been under care a year before with jaundice of four years’ duration. An operation was performed. On attempting to separate the adhesions about the ducts he bled so profusely that the operation had to be abandoned.’

Should there be chronic jaundice or a tendency to hæmorrhage, calcium chloride is given; for although there is a greater tendency to bleeding in chronic jaundice from pancreatic disease than when jaundice is due to gall-stone obstruction, I think there can be no doubt that in all cholæmic conditions the blood becomes so altered that the coagulability becomes seriously diminished; hence, these factors demand serious attention before any operation is undertaken in cases of common-duct cholelithiasis.

After reading Professor Wright’s researches on the coagulability of the blood (*British Medical Journal*, December 18, 1891), my mind was prepared to grasp the possibility of turning the experience gained on dogs to practical uses in the human subject, as I had lost two jaundiced patients, one in 1888 and one in 1890, from persistent oozing of blood subsequent to operation. I therefore at once began to employ it in these cases, and with benefit; but it has been only within the last three years that I have been able to get at the real value of the drug, which is one I now always employ in jaundiced patients, both before operation in 30-grain doses by the mouth for two or three days, and afterwards in 60-grain doses by the rectum thrice daily for two or three days, or longer if needful.

As bearing out these observations, the following extract from the Paris correspondent of the *Medical Press*, November 23, 1902, is worth noting:

‘The great hæmostatic value of chloride of calcium administered internally has not yet been entirely accepted, and yet it can in nearly all cases be depended upon. Dr. Bertignon took recently as the subject of his thesis this drug, and furnished a series of cases in which chloride of calcium was proved to be an excellent hæmostatic. He remarked that—

‘ It succeeded where perchloride of iron, antipyrin, ergotin, and hot injections failed, and was indicated in hæmorrhages of every kind, and in all maladies presenting hæmorrhagic complications. He stated that hæmatemesis, hæmaturia, enterorrhagia, and metrorrhagia are arrested rapidly by  $\text{CaCl}_2$ .’ M. Bertignon cited the case of a patient suffering from acute general purpura benefited, where ergotin, perchloride of iron, citric acid, etc., were tried without success.

Germain Sée, speaking on the subject, said that of all the coagulating solutions known, chloride of calcium was the most easily borne by the stomach. In more than one instance at the hospital had he seen it succeed when prescribed for grave hæmatemesis.

In jaundiced cases it is always desirable to ligature all bleeding-points rather than to trust to pressure forceps for hæmostasis. The subcutaneous injection of gelatin has been tried rather extensively abroad, but from the little I have seen of its use in England I decidedly prefer the calcium chloride.

A 2 per cent. solution of gelatin in normal saline fluid, and sterilized before use, is injected into the subcutaneous tissues in quantities of from 4 to 6 ounces; it causes considerable pain for a little time, and generally a rise of temperature to  $100^{\circ}$  F. or more.

In chronic jaundice cases it may be injected a day or two before operation, on the day of operation, and subsequently, according to circumstances. It must not be forgotten that some cases of tetanus have occurred after the subcutaneous injection of gelatin. Perhaps the administration of gelatin by the mouth or by the rectum in the shape of jelly or broth may be found useful.

As a general styptic, suprarenal extract is sometimes most useful, and Dr. Soltau Fenwick, in a communication to the *British Medical Journal*, November 30, 1901, says that he has abandoned all other methods of treatment in bleeding from the stomach in its favour. The plan usually adopted was to administer 10 fluid ounces of freshly-prepared concoction containing 2 grains of the desiccated gland to the ounce as soon as possible after an attack of hæmatemesis, and to

repeat the dose at the end of two hours. In two instances where melena was the sole symptom, three doses were given in four hours. In no case were unpleasant symptoms observed, though occasionally the first dose produced an indication of vomiting. This method of treatment might prove of great service in gall-bladder surgery, in case of that serious complication of post-operative hæmatemesis, which is apparently dependent on capillary hæmorrhage from the congested mucous membrane, and which was the cause of death in one of the cases reported in the appendix.

**Suture of Abdominal Wound.**—In order to remove the danger of ventral hernia, the abdominal wound should be sutured layer by layer, employing buried catgut for the deep and silkworm gut for the superficial sutures; but if the operation has been very prolonged, and the patient be suffering from shock, it may be advisable to suture the parietes *en masse*, using silk of medium thickness or Pagenstecher's thread, and passing the sutures through all the layers from within outward at intervals of  $\frac{1}{2}$  inch. Where it is considered necessary to employ gauze-packing or a wick drain, it is well to apply the sutures and to leave them long, so as to be able to draw the edges of the wound together after the tampon has been removed without putting the patient to the inconvenience of inserting stitches later.

**Drainage.**—In an ordinary gall-stone operation, drainage of the abdomen, apart from drainage of the gall-bladder, is usually unnecessary; but where the ducts have had to be incised, as in choledochotomy, and any infected bile has escaped and soiled the tissues, drainage is safer, for, owing to the separation of adhesions, there is generally some pouring out of fluid immediately after operation, and should this become infected a fear of septic complications is far from problematical.

A stab wound in the loin, through which a tube is passed into the right kidney pouch, effectually prevents any accumulation, but an even simpler, and in my experience an equally efficient, method, is to split an ordinary medium-sized rubber tube, and in it to insert a piece of aseptic gauze, just project-

ing from the end of the tube. This is passed down to the region of the duct that has been sutured, and brought out by the side of the tube that is draining the gall-bladder. In twenty-four hours this tube may be replaced by a smaller one prepared beforehand, and in another twenty-four hours that may be removed and not replaced.

## CHAPTER VIII

### CHOLECYSTOTOMY

CHOLECYSTOTOMY, or cholecystostomy, usually follows on exploration, as it is unquestionably the operation *par excellence* in the treatment of gall-stones.

The indications for the operation are :

1. In cases where the gall-bladder is sufficiently large to permit of drainage, after gall-stones have been removed from the gall-bladder or ducts.

2. Very rarely in cases where, although there are gall-stones in the ducts, the patient is too ill to bear a prolonged operation, the gall-stones being deliberately left for subsequent treatment when the patient is in better condition.

3. In empyema of the gall-bladder, where that viscus is not too much disorganized to be permitted to remain.

4. In certain cases of chronic catarrh of the gall-bladder or bile-ducts.

5. In infective and suppurative cholangitis.

6. In obstruction of the ducts due to hydatid disease.

7. In dropsy of the gall-bladder after removal of obstruction.

8. In idiopathic rupture, or laceration, or gunshot injury of the gall-bladder or ducts, when cholecystectomy is undesirable.

9. In cases of choledochotomy, in order to avoid tension in the sutured duct.

10. In certain cases of obstructive jaundice dependent on malignant tumour, which is occluding the ducts. In these cases the increased danger must be borne in mind.

11. In some cases of phlegmonous cholecystitis where the patient is too ill to bear cholecystectomy.



12. In chronic pancreatitis, where at the same time both the bile and pancreatic ducts are drained.

The operation has been fully described on p. 249, but there are other points which can be conveniently mentioned here.

The description already given applies to the ordinary operation on a gall-bladder of normal size, or to one distended, as well as to a contracted gall-bladder situated deeply, which can be most easily dealt with when the edge of the liver can be lifted up or the whole liver rotated ; but occasionally the liver is retracted beneath the costal margin or contracted in size, so that the gall-bladder has to be dealt with at some distance from the surface, when the operation may be prolonged and difficult.

When unable to bring up the gall-bladder, it has at times been possible to tuck down the parietal peritoneum to the edges of the gall-bladder opening, and so to effect suture of the contiguous margins ; but in several cases where this could not be done, the right border of the omentum has been sutured to the margin of the gall-bladder and to the parietal peritoneum, thus forming a tube of peritoneum around the drainage-tube, and shutting out the general peritoneal cavity. This method, which we described some years ago, has also since been efficiently employed by others. Where occlusion in this way cannot be effected, the insertion of a drainage-tube into the gall-bladder, without suture of the margins to the parietes, seems to be efficient, for it is, on account of intra-abdominal tension, easier for the bile to pass away directly through the tube than to enter the abdomen, and it is probable that within from twenty-four to forty-eight hours plastic effusion shuts out the drainage track from the general peritoneal cavity.

Where the gall-bladder is small and deeply placed, the tube may be inserted in it and a running catgut suture applied around the margin of the incision in the gall-bladder, so that when tightened it draws the edges of the incision closely around the tube ; the same suture may then be passed through the tube and tied so as to fix it in position and prevent it slipping, until the catgut softens in about a week or ten days, when the tube can be safely removed. The method of gauze

packing is also a safe means of shutting off the peritoneal cavity.

In all cases of drainage of the gall-bladder I now fix the tube in by a running catgut suture as just described, as it not only saves the wound from contamination, but also saves soiling of the dressings, as the discharge is conveyed direct into a bottle placed by the side of the patient.

Mr. Knowsley Thornton suggested suprapubic drainage in cases where occlusion of the bile channels is doubtful; but if drainage of the abdominal cavity is required in such cases, it can be done better either by means of a tube passed into the right kidney pouch and brought out at the lower end of the original incision, or through a stab puncture in the right loin, as already described on p. 268.

Dr. Murphy has invented a 'button-tube' for use in cases where the gall-bladder is contracted and cannot be brought to the surface; but in practice it will usually be found that the contracted gall-bladder is too small to permit of its employment. In certain cases where the gall-bladder is contracted, after opening and clearing it and the ducts, the incision may be immediately closed by suture, the line of incision being isolated by a gauze drain; or in other cases cholecystectomy may be performed and the cystic duct ligatured, the gauze drain being again employed; or, as suggested by Morison, the incision in the gall-bladder may be deliberately left patent, and the bile allowed to run into the right kidney pouch, from which it is removed by a drainage-tube in the loin.

The operation of cholecystotomy has been modified in several ways; for instance, the opening has been closed and then fixed to the abdominal incision, which has been closed over it; this operation is known as cholecystendysis (Courvoisier).

It can only be of use where the ducts are known to be thoroughly cleared, where there is no fear of subsequent stricture, and where there is no catarrh or inflammation of the bladder or bile passages. In Case 116 it was employed for the cure of a biliary fistula.

The so-called 'ideal' operation suggested by Langenbach

(*Centralb. für Chirurgie*, 1887), in which the opening in the gall-bladder is sutured and the viscus returned without fixing it to the surface, has been thought by Lange, Meredith, Kuster, Keen, and others, to be attended with greater risk than the operation of cholecystostomy. If it be thought advisable to adopt this method, it is necessary to prove that the ducts are clear, and this may be accomplished by distending the gall-bladder with warm sterilized water, and then forcing it through the ducts, or by catheterism of the ducts, as advocated by Drs. Terrier and Dalby (*Revue de Chirurgie*). Of these methods, the former is to be preferred, both on account of its safety and efficiency.

Recently reported cases of 'ideal' cholecystotomy would seem to prove that the dangers at first attending the operation may be overcome by a proper selection of cases, and by carefully suturing the mucous and muscular, and then the serous, margins separately; but the serious objection to it is that the benefits of drainage are not obtained, as in the ordinary operation of cholecystotomy.

A use for this modification is found in cases where it has been necessary to open a contracted gall-bladder, but where, on account of the depth, it is found impracticable to bring it to the surface; also when, from the contraction of its cavity, it is found impossible to insert a drainage-tube, but in such cases cholecystectomy is the better operation.

The line of suture is made secure against dangerous leakage by the gauze drain, the lower end of which is packed moderately firmly over the gall-bladder.

Another modification suggested by Bloch is that in two stages. The operation consists in incising the parietes until the peritoneum is reached, the cavity of which, however, is not opened; the wound is then packed with gauze and left for several days, when adhesions will have formed between the gall-bladder and the parietal peritoneum. The gall-bladder can then be safely opened. Or, if the peritoneum be incised, the gall-bladder is fixed, but not opened until adhesions have formed.

As the method is only available for the simplest cases—viz., where the gall-bladder is distended,—as it does away with all

chance of exploring the ducts by the hand within the abdomen, and as it is frequently followed by fistula, it needs only to be mentioned to be condemned as clumsy and uncertain, and no safer than the ordinary operation of cholecystotomy.

To this opinion there may be one exception: the operation *à deux temps* presents considerable advantages when cholecystotomy is being undertaken in the presence of chronic jaundice associated with distended gall-bladder in a patient extremely ill, as in such cases there is usually malignant disease either of the head of the pancreas or of the bile-ducts; and when the peritoneum is exposed, but not opened, pressure can be applied to arrest the subsequent oozing of blood, which cannot always be prevented by ligatures or forceps. Bloch, however, in his original papers, and again in the *Revue de Chirurgie* for 1895, does not recommend the operation for this reason, but on account of the fear of septic contamination of the peritoneum, which ample experience proves to be groundless.

Délagenière (*British Medical Journal Supplement*, May 6, 1889) exposes the gall-bladder and raises the edge of the liver as high as possible with a retractor. Then the peritoneum is guarded with a compressor or sponge, and the fundus of the gall-bladder opened. The incision is enlarged with scissors along the left aspect of the gall-bladder till the calculi to be removed are reached. A Kocher's forceps is placed on each side of the incision; the two will draw the deeper parts well towards the abdominal wall. The duct may be cut open almost to its termination in a bad case. When the calculi are extracted, he closes the long incision in the duct and gall-bladder with a continuous silk suture, and applies an external layer of interrupted sutures. To establish a biliary fistula, about half an inch of the incision at the fundus is left open. The peritoneum is then sutured all round this opening in the usual manner. A hole is then made in the right rectus muscle, and the free piece of the wall of the gall-bladder drawn into it, the edges of the opening being stitched to the edges of the hole in the muscle. Another buttonhole is made in the skin over the hole in the

rectus, and through this a drainage-tube is passed into the gall-bladder. The original abdominal incision is then closed.

The statistics of cholecystotomy vary very considerably according to the conditions for which the operation is performed.

In my own experience, where the operation has been undertaken for simple disease, such as gall-stones, in the absence of malignant disease and jaundice with suppurative and infective cholangitis, there were 3 deaths in 281 cases, giving a mortality of 1·06 per cent.

If the complicated cases, such as phlegmonous cholecystitis, gangrene of the gall-bladder, suppurative or infective cholangitis (all of which are classified by Kehr as complicated cases) be included, many of these being not associated with gall-stones, the mortality is 2·7 per cent.

If the malignant cases, where cholecystotomy has been performed in the presence of cancer of the pancreas or bile-ducts (22 in number), be included, the mortality of the whole series is 5·8 per cent.

The deaths which occurred in 'simple' cases were those of an old gentleman, aged sixty-six, who had mitral disease, with evidence for some months of failure of compensation, and in whom operation was only performed at his urgent request, since his sufferings were such as to induce him to undertake the special risk; of an old man of sixty-two, who had apparently made a good recovery from operation, but died from collapse on the twenty-third day; and of an extremely stout middle-aged woman, a morphino-maniac who died of pneumonia on the seventh day.

Dr. W. J. Mayo, of Rochester, Minnesota, in a paper published in June, 1902, in the *Annals of Surgery*, gives 227 cases of cholecystotomy for various simple conditions, for the most part gall-stones, with 6 deaths, or 2·6 per cent. mortality, whereas in malignant disease, of 4 cholecystotomies 2 died. In a paper published in the *Boston Medical and Surgical Journal*, May 21, 1903, he gives 352 cholecystotomies for simple conditions, with 8 deaths, or a mortality of 2·27 per cent.; whereas of 5 cases in which cholecystotomy had

been done for malignant disease, three died, equal to 60 per cent. mortality.

Courvoisier gives the statistics, up to 1890, of 104 cases, the mortality being 21·14 per cent., and 16 per cent. had fistulæ. Of 31 cases operated on in two stages, the mortality was only 12·5 per cent., but 34 per cent. were left with a fistula.

Martig, up to 1893, gave the mortality as 17 per cent., with a fistula remaining in 20 per cent.; for the operation *à deux temps*, he gave a mortality of 10 per cent.

Kehr, Halberstadt (*Berlin Klin. Woch.*, June 15, 1896), gives the result of 209 operations on the gall-bladder and bile-ducts in 174 patients. Of his simple cholecystotomies there was barely 1 per cent. of deaths, but of his complicated cases the mortality was 58·8 per cent., or a loss of 10 out of 17 cases, making the all-round mortality a little over 6 per cent. In a later series (*Langenbeck's Archives*, vol. lviii., p. 3) he reports 202 operations, with a mortality of 32 (16 per cent.), and attributes the higher mortality to the increased gravity of the cases. In conservative operations on the gall-bladder he lost 3 patients out of 68 operations—*i.e.*, a mortality of 4·4 per cent.

In Kehr's latest published statistics (*Münchener Med. Woch.*, 1902) he gives 720 laparotomies for gall-stones, with 15·5 per cent. mortality; the simple cholecystotomies had 2·1 per cent. mortality; but the complicated cases, including malignant disease, had a mortality of 97 per cent.

The late Greig Smith reported 11 simple cases without a death, and 1 complicated case which died, equivalent to 8·33 per cent.

The late Lawson Tait published 55 cases with 3 deaths, showing a mortality of 5·4 per cent.

With regard to recurrence, if the ducts be cleared and the gall-bladder drained, relapse is rare, and I have yet to see my first case in which a genuine recurrence of gall-stones has occurred. Kehr and Mayo have had a similar experience.

An eminent operator recently said that he found fistula frequently followed on cholecystotomy, which, however, is quite at variance with my experience since adopting the

modification of suturing the edge of the gall-bladder incision to the aponeurosis and not to the skin, which distinctly proves that fistula will only follow under such circumstances if the ducts have not been cleared, and then it is better that there should be such a safety-valve, which can be remedied by a further operation.

Out of the simple cholecystotomies recorded in the tables below, fistula occurred in 16 cases. In the first 10 there were 5 fistulæ: these were all operated on by stitching the gall-bladder to the skin, as proposed by Lawson Tait. In the later cases, where the opening in the gall-bladder was sutured to the aponeurosis, and not to the skin, there were only 11 fistulæ, which were nearly all treated by further clearing the duct or short-circuiting the obstruction. The more thorough operation which extension of the incision upward enables one to do, insures a clearance of the gall-stones from the bile-ducts, including the common and hepatic ducts; there should, therefore, now seldom be need for a second operation.

As one would expect, cholecystotomy *à deux temps* is often followed by fistula. Martig gives 20 per cent., and Courvoisier 34 per cent., which, of course, are due to imperfect clearing of the ducts.

After cholecystotomy has been performed and the gall-bladder cleared of its contents, it may be found impracticable to remove other gall-stones impacted in the cystic or common ducts, either by means of forceps or scoop introduced through the gall-bladder incision or by digital manipulation from without. Under such circumstances the gall-stones must be removed by choledochotomy.

## CHAPTER IX

### CALCULI IN THE COMMON BILE-DUCT

ACCORDING to Courvoisier, this condition occurs in about 4 per cent. of all cases of cholelithiasis. A reference to the cases that have come under my care shows this to be an underestimate, as, out of 380 cases of cholelithiasis operated on, there were gall-stones in the common bile-duct on 150 occasions, which equals 39·4 per cent.

Fenger, in the *Annals of Surgery*, quoted Conrade, who said that in 97 cases, he found gall-stones in the gall-bladder alone in 82, in the gall-bladder and common duct in 10, and in the common duct alone in 5.

Courvoisier says that in two-thirds of the cases there is only one gall-stone, and in the remaining third they are multiple, six being the largest number. My experience shows a much larger proportion of multiple calculi in the common duct, and I have removed as many as eighty-eight calculi from the ductus communis.

In 67 per cent. the stone is in the duodenal end of the duct, in 15 per cent. in the hepatic, and in 18 per cent. in the middle portion, where it is most easily reached. In about a quarter of the cases the duct was dilated, and in some it was cystic and the gall-stone floating.

Fenger has dwelt on the great importance of the ball-valve action of floating stones in the common bile-duct, as explaining the remission of jaundice in many cases, where it might have been supposed that the jaundice would be persistent. In the greater number of the cases of gall-stones in the common duct given in the Appendix, the concretions were, though easily moved by the fingers, too fixed to be called floating.



Fenger explains the contracted condition of the gall-bladder, which is almost universally found in cholelithiasis by this floating of gall-stones in the ducts; but as the same condition occurs where the gall-stones are fixed, this explanation must be only a partial one.

In a paper I communicated to the Clinical Society in 1888, and again in my work 'On Gall-stones and their Treatment' (Cassell and Co.), published in 1892, attention was drawn to this contraction of the gall-bladder as an important diagnostic point, and this has been borne out by other observers independently. It was then pointed out that jaundice with distended gall-bladder was presumptive evidence in favour of malignant disease, but that jaundice without distended gall-bladder favoured the diagnosis of cholelithiasis.

Of 35 operations for obstruction in the common duct, Courvoisier found that 18 were due to causes unconnected with gall-stones, such as cancer, stricture, or tumour; out of these, the gall-bladder was dilated in 16, whereas only 17 were dependent on gall-stones, and out of these 17 the gall-bladder was atrophied in 13.

Whilst Fenger's explanation is not all-sufficient to account for this contraction of the gall-bladder, neither does that given by Courvoisier fully explain it. He says the contraction is due to chronic inflammation of the walls of the gall-bladder, set up by the stones when in it, before they passed into the ducts. This cannot account for all cases, for in some the gall-stones have never been in the gall-bladder, having been formed in the hepatic or common ducts. The condition is probably due to a combination of causes:—

1. All cases of cholelithiasis producing symptoms are accompanied by inflammation of the walls of the biliary passages, as shown by the almost universal presence of adhesions around the gall-bladder.

2. Gall-stones in the common duct seldom cause complete obstruction, either because they are floating in the duct or because they only partially fill it. There is, therefore, no sufficient backward pressure to cause dilatation of the gall-bladder.

3. The muscular coat of the gall-bladder contracts in

efforts of expulsion when there is any obstruction in the common duct.

4. The contraction, from being at first intermittent, becomes, in the long-run, constant, and the accompanying inflammation fixing the contracted gall-bladder, it atrophies.

The special symptoms pointing to stone in the common duct are: absence of enlargement of the gall-bladder, with frequent attacks of pain, which is usually less severe when the gall-stones are in the common duct than when they are in the cystic duct, followed by intensification of the jaundice, which in many cases never quite disappears. The seizures are often associated with intermittent feverish attacks, accompanied by rigors and loss of weight and strength. The pain is in the epigastric rather than in the right hypochondriac region, and passes through to the right dorsal or lumbar, rather than to the right infra-scapular, region, and the tender point is found between the umbilicus and ensiform cartilage, rather than between the ninth costal cartilage and umbilicus, as in ordinary cholelithiasis.

Jaundice in connection with gall-stones in the common duct is a very variable symptom. In some cases it is so slight as to be barely noticeable, while in others the jaundice is the most marked feature. In all cases of common duct cholelithiasis it varies from time to time.

Where jaundice is continuous and intense without much variation, especially if the gall-bladder be enlarged, there is usually malignant disease, or some other cause than gall-stones. All the other symptoms characteristic of gall-stones may have been present for some time previously, or may co-exist with those above-mentioned. The following histories illustrate the symptoms usually associated with common duct cholelithiasis:

CASE 217.—Mrs. M. J., aged forty-nine, seen with Dr. I., of Huddersfield, May 16, 1898. History of spasms for six years; then an interval of six years without any symptoms. In July, 1897, began with paroxysms of pain over the liver, which continued till January, when jaundice supervened, and each attack of pain was accompanied by ague-like seizures,

the jaundice in the interval diminishing. Great loss of flesh; some enlargement of the liver; no tumour of gall-bladder; slight jaundice; some dilatation of the stomach.

*Operation, May, 1898.*—Pylorus fixed to shrunken gall-bladder, producing a kink; adhesions detached; no gall-stones in gall-bladder or cystic duct; several stones removed from the common duct by choledochotomy; duct sutured; gauze drainage. Good recovery. Well several years later.

CASE 218.—Mr. J. G., aged thirty-nine, admitted to the Leeds General Infirmary, May 17, 1898, suffering from jaundice of moderate intensity. First attack six and a half years ago. Pain more or less continuous since, and occasionally had severe paroxysmal attacks lasting twelve to thirteen minutes. The attacks had been accompanied by vomiting and rigors, and followed by jaundice. He had lost 2 stones in weight since the attacks first began. No tumour could be made out. Gall-bladder atrophied, and could not be found.

*Operation, May 19, 1898.*—Large gall-stone found impacted in third part of the common duct. Duodenum incised, and a stone the size of a filbert removed from common bile-duct through an incision in the papilla. Good recovery.

Other cases will be found in the Appendix.

The treatment of calculous obstruction in the common duct is of the utmost interest, both on account of the difficulties to be overcome and the great importance to the patient.

When once gall-stones have reached the common duct, their attempted dislodgment by purely medical means is, with few exceptions, disappointing in the extreme, and the unfortunate patients are condemned to a lingering and painful illness, usually ending in death, unless the obstruction can be removed by surgical intervention. Seeing that it is only thirteen years since Courvoisier first removed a gall-stone from the common duct by direct incision, the progress in this branch of surgery must be very pronounced when we can safely affirm that there is no portion of the gall-bladder, cystic, common, or primary division of the hepatic ducts, which cannot, under ordinary circumstances, be reached for

the removal of concretions, and that with great probability of success.

The following methods are available for the removal of calculi from the common duct under various conditions:

(a) In a few cases, when the cystic duct is dilated, concretions may be *manipulated backwards* into the gall-bladder, and thence extracted by scoop or forceps; but this is seldom practicable on account of the contraction of the gall-bladder and cystic duct usually found.

The following case is an example:

CASE 129.—Mrs. J. M., aged thirty-two, seen at the General Infirmary. Had suffered from attacks of biliary colic with jaundice, and after each attack four or five gall-stones had been passed.

*Operation, December 3, 1895.*—Large numbers of gall-stones in the gall-bladder and in the dilated cystic and common ducts. Cholecystotomy performed; 129 gall-stones removed, many being squeezed up from the common duct. Good recovery.

(b) Occasionally a small stone may be *pressed into the duodenum*, but this is exceptional, and not generally to be recommended, as not infrequently it may be pushed into a dilated diverticulum of Vater, and so be missed, and the whole operation rendered futile.

Case No. 480 is an example of the successful manipulation of a stone into the duodenum, from which it was afterwards removed.

(c) *Cholecystotomy, with subsequent treatment of the obstruction by solvent injections* of olive oil or soap solution, is well worth bearing in mind in exceptional cases where patients are extremely ill—and the common bile-duct cannot be easily exposed—on account of its simplicity and safety, together with the certainty of giving immediate relief with a modicum of risk, and putting the patient in better condition for subsequent treatment should such be necessary. I feel, however, bound to confess that my experience of solvent injections has not been so favourable as to make me very hopeful of accomplishing the solution or the diminution to the passing-point of the concretion deliberately left behind, and a subsequent

operation is usually necessary. This method is, however, of special value in patients too ill to bear an ordinary operation.

The following is an example :

CASE 179.—Mrs. E. A. N., aged fifty-nine, seen at the General Infirmary, had suffered from biliary colic fourteen years before. She had had three or four attacks the following year, and then had an interval of six years without any seizures. For the last six weeks the patient had had sometimes two to four attacks daily ; rigors and jaundice accompanied each attack ; tumour present.

*Operation, May 27, 1897.*—Cholecystotomy, with removal of numerous gall-stones from the gall-bladder, cystic, hepatic, and common ducts. Cholelithotriety was performed on six stones which could not be removed through the gall-bladder incision. After the operation injections of olive oil were made into the gall-bladder daily for several weeks. The patient made a good recovery, and is said to have remained well.

(d) *Cholelithotriety*, or crushing the stones *in situ*, where the concretions are sufficiently soft to yield to the pressure of the finger and thumb, is a method of treatment which is applicable to cases where the common duct is difficult to reach, as in very stout subjects, or where it is desirable to avoid prolonging the operation. It is only available in the case of soft concretions, and may have to be supplemented by injecting the ducts with a solvent solution (see p. 285, Chap. X.).

(e) *Needling concretions through the duct walls*, recommended by certain operators, is not unattended by danger, as the damage to the walls of the ducts may lead to subsequent trouble. It is not necessary for soft stones, and uncertain in the case of hard concretions.

(f) *Cholecystenterostomy*, or short-circuiting the obstruction, may be adopted where the patient is too ill to bear a prolonged operation, but it is by no means an ideal operation, as it leaves the obstruction untouched. Since in gall-stone obstruction the gall-bladder is usually contracted, cholecystenterostomy is impracticable in the greater number of cases ; moreover, if immediately successful, the small opening is liable to contract (see p. 312).

(g) *Choledochenterostomy*, or uniting the dilated cystic or common duct to the duodenum, in cases of largely dilated ducts with contraction of the gall-bladder, may be called for on rare occasions (see p. 197).

(h) *Choledochostomy*, or attaching the dilated duct to the surface and draining it, is so frequently associated with infection of the ducts in the liver that in a number of the cases reported a fatal result has followed. The operation is rarely called for. For examples, see p. 197.

(i) *Choledochotomy*, or incising the duct and removing the calculi, is the operation *par excellence* for the treatment of gall-stones in the common ducts (see Chap. XI., p. 288).

(j) *Duodeno-choledochotomy*, or reaching the duct through the opened duodenum for stones impacted in the duodenal end of the duct, is a useful modification of the operation (see p. 295).

It will thus be seen that in common cholelithiasis the surgeon has a great variety of operations to choose from, and he will act the wisest who, knowing all, is able on the spur of the moment to choose that peculiarly adapted to the case in hand.

## CHAPTER X

### CHOLELITHOTRITY

CHOLELITHOTRITY was first suggested and put in practice by Lawson Tait, and has since been extensively employed by many surgeons. The ordinary incision for cholecystotomy may be large enough, but if the patient be stout, or the ducts cannot be easily reached, it may have to be increased so as to allow the hand to pass into the peritoneal cavity, in order that the fingers may locate and grasp the stone *in situ*. If the right hand be used, the thumb will enter the foramen of Winslow, and the index-finger will pass in front of the common duct; or in case of the left hand being employed these digits will be reversed, when the whole force of the opposing finger and thumb can be brought to bear on the concretion. Usually the gall-stone flattens out into a wafer shape, and by altering the position of the digits the edges of the wafer are compressed, and the concretion is either converted into pulp or breaks into innumerable fragments, which can be passed on towards the duodenum or subsequently washed through.

In many cases of stones in the common duct the concretions will be found too hard to crush, and it will be necessary to perform choledochotomy.

The disadvantages of cholelithotritry are, first, the fear of seriously damaging the duct by the manipulation, and, secondly, the danger of leaving fragments permanently in the passages, which may then grow by further deposit of cholesterine.

The cases reported in the Appendix show that the first danger need not be feared if the finger and thumb only be

used as the compressing force ; but if attempts are made to crush hard stones by instrumental means, such as padded forceps, suggested by Tait, I should think there would be considerable danger of injuring the walls of the biliary passages.

In my earlier experience I employed it in a number of cases with considerable success and without any fatality, but as fragments are apt to be left behind and to produce further trouble, I have given up cholelithotripsy as a definite operation, and only crush the stones when I can extract the fragments subsequently by means of a scoop.

The following case is an example :

CASE 505.—Mrs. S., aged sixty-eight, seen with Dr. E., of York. For twelve years the patient had suffered from attacks of biliary colic followed by jaundice; lately the jaundice had become deeper after the attacks, and there had been considerable loss of flesh. The liver was slightly enlarged, but there was no enlargement of the gall-bladder. Great tenderness on pressure above and to the right of the umbilicus.

*Operation, April 28, 1903.*—Gall-bladder shrivelled and contracted. A large gall-stone the size of a bantam's egg was found in the common duct. This was crushed, an incision made into the duct, and the fragments extracted with a scoop. The openings in the gall-bladder and the common duct were closed by sutures, a drainage-tube being passed into the right kidney pouch. The patient made a good recovery.

Increased experience has led me to prefer the more exact operation of choledochotomy to that of cholelithotripsy, as in the latter there is always the uncertainty of having left fragments too large to pass the opening into the duodenum, whereas when the duct is incised it can be cleared with almost absolute certainty.

The danger of leaving fragments in the duct may be overcome by at the same time performing cholecystotomy and later syringing the ducts with sterilized water until they are clear of debris ; or, if any fragments should be unavoidably left, by applying through the fistula some solvent solution.

In Case 23, after cholecystotomy, with crushing of calculi in the common duct, the fragments did not pass until a few drops of solution of turpentine in ether were injected into



the fistula ; great pain followed, the duct became patent, the fistula closed, and the patient has remained well since. The result in this case was probably rather due to the contractions set up in the duct than to the solvent action of the remedy used ; and we cannot, on account of the severe pain set up for some hours, recommend its employment, though in this case the result was good. A more efficient method which we now employ whenever there is reason to think that any of the fragments remain in the duct (as shown by the discharge of bile continuing through the cholecystotomy opening beyond the normal two or three weeks), or wherever a gall-stone has been left which could not be crushed, and which it was not thought wise to remove by choledochotomy, is to syringe a warm 0·5 per cent. solution of *sapo animalis* or warm olive oil through the fistula night and morning until the passages are quite free.

The olive oil and soap solution probably act in a double capacity as solvents and as lubricants.

Dr. Brockbank found that a gall-stone placed in a 0·5 per cent. solution of *sapo animalis* in distilled water, and kept at the body heat in an incubator, lost 34 per cent. of its original weight in three weeks, and that a similar concretion in a 0·1 per cent. solution lost 14 per cent. of its weight in the same time.

The question of needling impacted concretions by the passage of a needle through the walls of the ducts was raised again by Mr. Pridgin Teale in 1895. The subject is referred to in 'Gall-stones and their Treatment,' published in 1892, and this method has been employed by Mr. Knowsley Thornton ; it was also fully discussed after a paper given before one of the societies, and it was almost unanimously decided that although concretions might be broken up by needling, the operation was inadvisable, on account of the almost unavoidable damage to the ducts and the fear of infection.

It may, however, be borne in mind that, if thought advisable, some of the very hard stones can be broken up by means of a needle, and that the fragments can be further crushed between the finger and thumb.

## CHAPTER XI

### CHOLEDOCHOTOMY

CHOLEDOCHOTOMY, or choledocholithotomy, is the name given to the operation of incising the common bile-duct for the extraction of gall-stones.

*History.*—It was first suggested by Langenbach in 1884, though Kummell (quoted by Fenger) stated in 1890 that he, several years before, had performed cholecystectomy on a female patient of forty, after which he had removed a stone the size of a walnut from the common duct through an incision which he afterwards sutured. The operation was a very prolonged one, and the woman died twenty-four hours afterwards.

Courvoisier performed the first successful operation on January 22, 1890, and two others, both successful, in February and March of the same year.

Since that time it has been done by many surgeons, and at the present time it may be confidently asserted that there is no portion of the gall-bladder, common, cystic, or primary divisions of the hepatic duct, which cannot, under ordinary circumstances, be reached for the removal of calculi.

*Operation.*—The ideal operation for the removal of stones from the common duct is choledochotomy, which, after experience of all the other methods, I have come to the conclusion is the only one to be relied upon, and as an operation is therefore worthy of special study. Moreover, as the result of experience in over 100 cases, I have been able to modify it in such a way that what was formerly a most difficult procedure, involving prolonged manipulation, special appliances, and at least two assistants, and only to be undertaken after

all other means had failed, is now a comparatively simple operation in the greater number of cases, only requiring the help of one assistant, and not requiring the use of any special apparatus.

By this method the time involved in the operation is reduced considerably, and where adhesions do not give unusual trouble, it is easy to complete the work in from thirty to forty minutes, which not only means a saving of time and fatigue to the operator, but a considerable saving of shock to the patient. A description of the operation as since modified is given on p. 249.

To those having little experience in this operation, the modifications may seem trivial, but to those who have experienced the difficulties of the ordinary procedure I feel sure that the method described, which enables the whole of the bile passages to be dealt with as a straight tube close to the surface, will be sufficiently appreciated.

It is of the utmost importance to clear the ducts, or the operation will be futile, as shown by Kehr, who left concretions behind in 16·6 per cent. of his cases, and by Riedel, Terrier, Fenger, Lauenstein, Kuster and others. Fenger has suggested a flexible metallic probe, which, he says, will give a click when it touches a stone, or which will produce a grating sensation when it passes one. This we know by experience to be a fallacious guide, as in one case, after carefully probing and even passing a scoop into both hepatic ducts, and up and down the common duct, without feeling a calculus, a finger inserted through the incision, felt a stone, which was then removed; but had we trusted to a probe, the calculus would have been left. The duct is usually dilated sufficiently to permit digital exploration, which, under such circumstances, we should always advise, reserving a bent probe, or, better still, a slender, bent scoop, for use where the duct is not capacious enough for the finger. The hepatic duct and its primary branches can be readily explored, and in Cases 217, etc., calculi were removed from them through an incision in the common duct.

If gall-stones be found in the hepatic duct, they may be reached by opening the common duct and passing a scoop

or forceps through this opening, or, if needful, the hepatic duct may be incised and the concretions removed, as in Cases 35, 440, and 508.

Dr. Elliott, of Boston, recommends the application of the sutures before removing the stone, and if interrupted stitches are employed this is certainly an advantage, though if the ducts have to be explored afterwards the sutures are rather in the way.

The same advantages may be obtained by introducing the

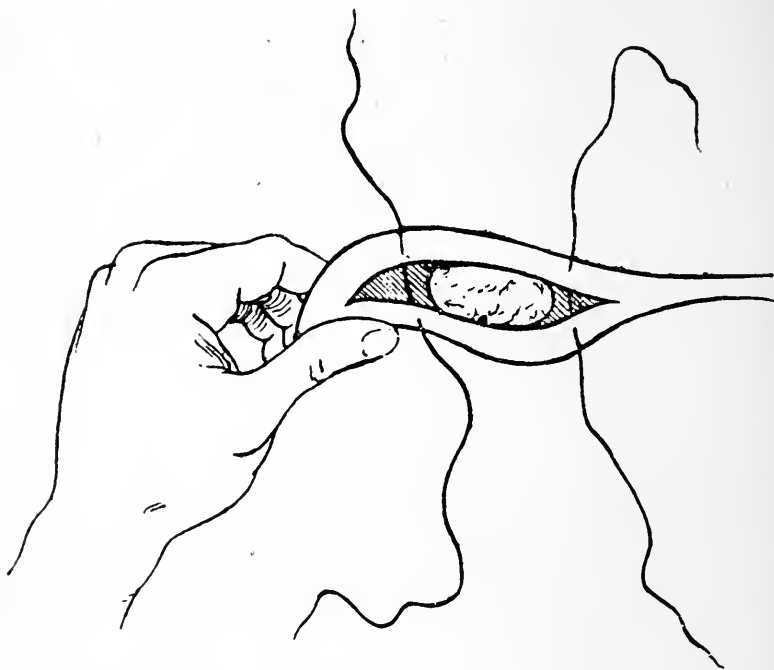


FIG. 66.—DIAGRAM TO ILLUSTRATE THE FIRST SUTURES IN CHOLEDOCHOTOMY

two end stitches before extracting the calculus, as when they are drawn on, the edges are approximated and more easily sutured (Fig. 66). It will, however, be seen that I prefer continuous sutures, and these I do not apply until I have cleared the ducts.

Professor Halstead (*Johns Hopkins Hospital Bulletin*, 1898) advocates the use of a small hammer which he has devised for facilitating the application of sutures in the repair of the common bile-duct. By expanding the duct and drawing it towards the surface, it not only temporarily

blocks the passage, but allows the sutures to be accurately applied. I have never found need to use this instrument, but it has been found useful by its author and others.

Drainage through a stab wound in the right loin, or by means of a split tube inserted by the side of the gall-bladder tube, is an efficient means of draining the discharge from a leaking gall-bladder or bile-duct, since there is a distinct peritoneal pouch, bounded above by the right lobe of the liver, below by the ascending layer of the transverse mesocolon covering the duodenum internally, externally by the parietal peritoneum, and internally by the peritoneum covering the right side of the vertebral column, and passing up to the foramen of Winslow (Fig. 68, p. 292).

Morison (*British Medical Journal*, November 3, 1894) has



FIG. 67.—HALSTEAD'S MINIATURE HAMMER, FOR USE IN SUTURING THE BILE-DUCT. (11 sizes.)

found it to be capable of holding nearly a pint before it overflows into the general peritoneal cavity. He advocates drainage of this pouch and non-suture of the ducts if there be any difficulty in securing the margins of the opening.

Mr. Frederick Page (*Lancet*, December 5, 1896), on the other hand, advocates careful suture of the opening in the duct, and closing the abdomen without leaving in a drainage-tube. He gives four cases in support of his views.

The late Mr. Greig Smith said that drainage is always advisable, and in this view we fully agree, as although we are usually confident of securing accurate suture of the opening in the duct, yet in one or two of the earlier cases a bile-stained discharge from the tube showed the need of a drain; and it must be borne in mind that, although the ducts appear

to be clear, it is impossible to be absolutely certain, as was proved in Case 141, where, under the supposition that the common duct had been effectually cleared, a shrivelled and mutilated gall-bladder was removed and the cystic duct ligatured, with the result that septic bile became extravasated into the peritoneal cavity. A small gall-stone was found obstructing the orifice of the duct, where it was opening into the duodenum. The same difficulty was experienced in one of Fenger's and in several of Kehr's cases.

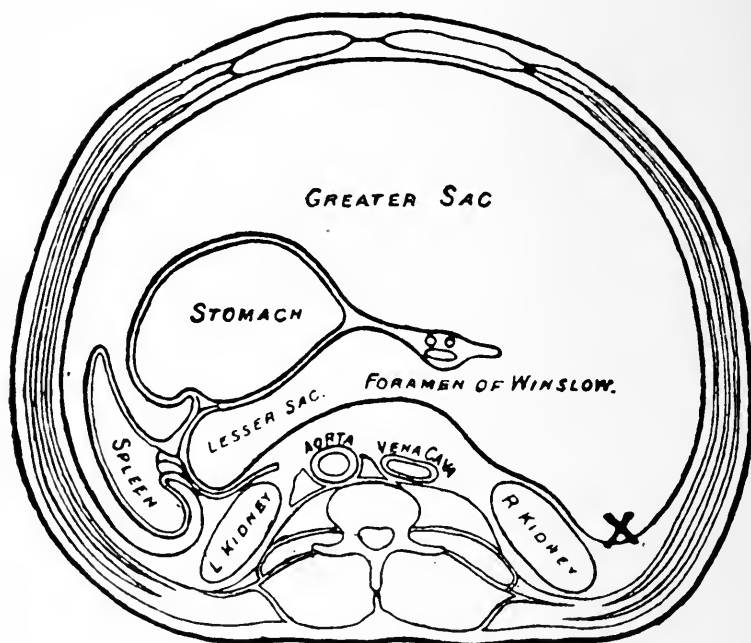


FIG. 68.—TRANSVERSE SECTION THROUGH CENTRE OF POUCH DESCRIBED.

The following are examples of choledochotomy :

CASE 398.—*Choledochotomy*.—A man, aged fifty-three years, who was seen at the Leeds General Infirmary, had had colic for twelve years and jaundice for two years, the jaundice having been very deep for some time. On October 10, 1901, choledochotomy was performed in the manner previously described, and a stone was removed from the common duct. The patient returned home within the month and was well when seen in December, 1901.

CASE 400.—*Choledochotomy*.—A man, aged fifty-eight years, was seen with Dr. R., of Preston. He had had very deep jaundice for three years. Biliary cirrhosis and ascites as well as jaundice were present, and there was a stone in the common

duct. On October 21, 1901, choledochotomy was performed and the omentum was fixed to the anterior abdominal wall, in order to cure the ascites. Anterior drainage was employed. In December, 1901, I had a letter to say that he was regaining strength and feeling well, and I am told that he has completely regained his health. In June, 1903, he was well, and had had no return of ascites.

The following are examples of removal of calculi from the hepatic duct :

CASE 406.—*Calculi in the Gall-bladder and in the Hepatic and Common Bile-ducts—Choledochotomy—Recovery.*—A policeman, aged forty-eight, a stout, unhealthy subject, with a history of former intemperance, had suffered from gall-stones for twenty years, and from jaundice with infective cholangitis since May, 1901. On December 7, 1901, choledochotomy was performed in the infirmary, when 126 gall-stones were removed from the gall-bladder, and 88 from the common and hepatic ducts. Recovery was retarded by bronchitis, but the patient was discharged in five weeks, and has remained well.

CASE 451.—*Calculi in Gall-bladder and in the Common and Hepatic Ducts — Choledochotomy — Recovery.* — On July 17, 1902, I operated on a lady, aged seventy, and removed a considerable number of gall-stones from both arms of the hepatic duct, after clearing the common duct of concretions through a choledochotomy opening. The patient is, I am informed, now quite well.

In some cases the common bile-duct is found dilated to the size of the small intestine, and if the gall-bladder and cystic duct are small, and so contracted as to be useless for drainage, a firm rubber tube is inserted into the incision in the duct and pushed a little way up into the hepatic duct, the tube being surrounded by a purse-string suture, and fixed in position by one or two catgut stitches, as in the following case :

CASE 394.—*Choledochotomy—Drainage—Recovery.*—I saw the patient, a man, aged fifty-one, with Dr. H., of Upwell. There had been only slight colic, but for a year deep jaundice, with great wasting and infective cholangitis. Choledochotomy was performed on September 29, 1901, five stones being removed from the common duct. As there was chronic

pancreatitis, the dilated common duct was drained by means of a rubber tube fixed in by a stitch of catgut, and surrounded by a purse-string suture. A lumbar drain was also inserted, but, as events proved, this was unnecessary. The patient was very well and had gained 1 stone 3 pounds in weight by November, 1901. He remained well when heard of in June, 1902.

*Statistics.*—As this is, perhaps, the most difficult and prolonged of the operations on the bile-ducts, the mortality is necessarily greater than that of simple cholecystotomy. In 1892 Martig had collected 27 cases, and in 1895 Mermann 17 others, giving a total of 44 cases, with a mortality of 18 per cent. Terrier (*British Medical Journal Supplement*, January 7, 1893), in 1892, had collected 20 cases, with a mortality of 25 per cent. Hans Kehr (*Berlin Klin. Woch.*, June, 1896) collected from various sources 84 cases of choledochotomy, with 31 deaths, giving a mortality of 37·8 per cent. Even excluding severe cases, the mortality was 25 per cent., though in his own practice the death-rate was only 6·6 per cent. In a later series (*Langenbeck's Archives*, vol. lviii., Part 3) his mortality was 12·5 per cent.

He remarks: 'The operation involves many difficulties, which can only be overcome by one performing a large number of operations, and even then it is not very easy to remove all the concretions. Out of 30 cases, in 5 all the stones were not removed, in 3 the operation was repeated, and in 2 cases the wound reopened and gave exit to the calculi that had been left. Fenger has reported 7 cases, of which 1 died, giving a mortality of 14·3 per cent.

Dr. W. J. Mayo, of Rochester, Minnesota, gave a paper in May, 1903 (*Boston Medical and Surgical Journal*, May 21, 1903), and reported having performed 59 choledochotomies, of which 3 died, which gives a mortality of 5·08 per cent.

My own experience in this operation has been very interesting, for of the 37 cases operated on up to July, 1901, 4 died, giving the rate of mortality of 16·2 per cent., whereas out of the operations since July, 1901, 51 in number, I have only lost 1, thus giving a rate of mortality of 1·9 per cent.; and I have had a consecutive series of 52 choledochotomies and duodeno-choledochotomies without a death.



**DUODENO-CHOLEDOCHOTOMY.**

Duodeno-choledochotomy is a term applied to the modification of the operation of choledochotomy, in which the gallstones are removed from the common duct through an incision in the duodenum. Duodeno-choledochotomy was first performed by Dr. McBurney (*Annals of Surgery*, October 18, 1893), next by Professor Kocher (*Korresp. f. Sch. Hertze*, 1895, No. 7), and I believe that Case 182 was the first performed in this country (*British Medical Journal*, November 5, 1898).

*Statistics.*—I have performed 15 duodeno-choledochotomies with recovery in 12, the last 9 cases having all recovered.

*Operation.*—The operation is really less difficult than it would appear, and is much facilitated by placing a sandbag under the lower dorsal spines. Where the liver is small and the common duct cannot be made to reach the surface, its exposure through the duodenum may be simpler than the ordinary operation of choledochotomy. The termination of the common duct, including the duodenum, should be grasped between the finger and thumb of the left hand, and the anterior wall of the gut cut through, thus exposing the interior of the posterior wall of the intestine with the termination of the common duct running in it (see *Anatomy*, p. 10). Either the duct can be laid open from the papilla, or the stone may be cut down on through the posterior wall of the duodenum. Bile flows freely as soon as the obstruction is removed, and it must be mopped away as it flows, since it always contains pyogenic microbes, and is therefore infective. As a rule, there will be no trouble with bleeding, and no sutures need be placed in the posterior wall of the duodenum. The incision through which the duodenum has been opened should be sutured by a continuous catgut suture for the mucous membrane and a continuous silk or celluloid thread suture for the peritoneum.

For calculi impacted in the diverticulum of Vater, the operation is preferable to the ordinary choledochotomy, as it is occasionally difficult to extract a stone impacted in the ampulla through an incision in the supraduodenal portion of the common duct; moreover, an incision of the narrow orifice of

the bile-duct in the duodenum leaves a patent opening, which will allow any other concretions that may have escaped observation to pass without difficulty.

This method of reaching the common duct will in all probability be practised more frequently than hitherto now that its safety and practicability have been established.

It is available not only for gall-stone obstruction, but also for jaundice depending on cancer of the opening of the common bile-duct (see p. 211), or on stricture (Case 436, p. 115), and for obstruction of the orifice of the pancreatic duct.

Some years ago I suggested the feasibility of exploring the pancreatic duct by this route, and in February of this year I removed a pancreatic calculus in this way (Case 487).

Zeller (*Berlin Klin. Woch.*, September 1, 1902) reported a case in which he operated for obstructive jaundice, and, failing to find a calculus in the bile-ducts, although he palpated from without from the duodenum and from the pancreas, he made a diagnosis of malignant disease of the pancreas, as there was a hard nodular mass in the head of that organ. The patient died six days after the operation, and at the necropsy he found, on passing a probe through the papilla, after opening the duodenum, a calculus about the size of a hazel-nut. Since then he has always opened the duodenum and passed a probe through the papilla if he failed to find a calculus on searching along the course of the ducts. He says that at times it is easier to dislodge the calculus by passing the sound backwards through the common duct than downwards from the gall-bladder, and is of opinion that the operation is in many cases preferable to choledochotomy.

The following cases are given as examples, and others will be found in the Appendix :

CASE 354.—*Duodeno-Choledochotomy*.—Mrs. G., aged thirty-eight, was seen by me at the General Infirmary. There had been colic and jaundice for six months, with loss of weight and strength. Deep jaundice was present; there were gall-stones in the common duct. Duodeno-choledochotomy, performed on January 31, 1901, resulted in a good recovery, and the patient was well some months later.

CASE 363.—*Duodeno-choledochotomy—Recovery.*—A woman, aged forty-nine, was seen at the General Infirmary. For six years colic had persisted, with varying jaundice. On March 22, 1901, duodeno-choledochotomy was performed, and eight large, together with numerous small, gall-stones were removed from the common duct. A good recovery ensued, the patient being well some months later.

### RETRODUODENAL CHOLEDOCHOTOMY.

Berg (*Centralbl. f. Chir.*, No. 27, 1903) points out that McBurney's method of removing an impacted calculus from the retroduodenal portion of the ductus communis through an incision made into the lumen of the duodenum is difficult and not free from danger. It is not always possible to find the duodenal papilla of the duct, and, beyond the slight risk of primary peritoneal infection, there is the serious and more likely one of the formation of an external duodenal fistula. The author describes the different steps of an operation which he has practised to his full satisfaction on the cadaver. This consists in making a vertical incision through the posterior parietal peritoneum on the right side of the descending portion of the duodenum, so as to mobilize this portion of the intestine and to render it capable of being moved over towards the left side of the abdomen, and also of being rotated in the same direction. By this rotation the posterior surface of the intestine, together with the retroduodenal and papillary portions of the ductus communis, may be brought forward and freely exposed to view. The duct, it is stated, can be readily recognised when thus exposed, and, whilst retained between the surgeon's fingers, be incised for the release of any impacted body.

*Hepato-dochotomy.*—This operation of directly incising the hepatic duct for the removal of gall-stones may be conveniently termed hepato-dochotomy. It differs in no respect from choledochotomy, except that the hepatic duct is incised instead of the common duct, the operation having been rendered possible by the more complete exposure obtained by the method described on p. 249. Cases 35, 440 and 508 are examples.

## CHAPTER XII

### CHOLECYSTECTOMY

CHOLECYSTECTOMY, or excision of the gall-bladder, may be required—

1. In bullet-wound or other wound of the gall-bladder where suture is impracticable.

2. In stricture of the cystic duct.

3. In phlegmonous cholecystitis and in gangrene of the gall-bladder.

4. In multiple or in perforating ulcers.

5. In chronic cholecystitis from gall-stones, where the gall-bladder is shrunk and too small to safely drain, or where it is enlarged, thickened, and ulcerated, the common duct being free from obstruction.

6. In mucous fistula due to stricture of the cystic duct.

7. In hydrops of the gall-bladder due to stricture of the cystic duct, as also in certain other cases where the gall-bladder is very much dilated.

8. In certain cases of empyema, where the walls of the gall-bladder are seriously damaged.

9. In cancer, where the disease is limited to the gall-bladder or to the immediately adjoining parts, and where there is no evidence either of extensive glandular infection or of secondary growths in the liver or elsewhere.

10. In certain other solid tumours of the gall-bladder, whether inflammatory or due to neoplasm.

11. In calcareous gall-bladder.

The operation varies in its extent and in character according to the disease for which it has to be undertaken, but in all cases it may be carried out through the usual incision for reaching the gall-bladder.

*For malignant disease* cholecystectomy has been performed on numerous occasions, and with an encouraging amount of success. We have related several examples in the chapter on Tumours, p. 186. In these cases not only must the gall-bladder itself be freely excised, but it may be necessary to remove a portion of the liver adjoining the gall-bladder or an elongated right hepatic lobe ; or it may be advisable even to perform pylorectomy or enterectomy at the same time. The operation may be performed by cutting instruments, by Paquelin's cautery, or by means of the elastic ligature.

A reference to the list of cases in the Appendix will show that there were 12 cholecystectomies for malignant disease, of which 9 recovered, one patient being at the present time in good health, four years and another three years after operation.

Examples of removal by the elastic ligature and by incision follow, and others will be found on p. 186.

CASE 273.—*Excision of Cancer of Liver and Gall-bladder—Recovery.*—A man, aged forty-six, had suffered for seven years from gall-stone attacks and infective cholangitis. Loss of 4 stones in weight ; jaundice.

*Operation, June 26, 1899.*—Tumour of liver adjoining gall-bladder excised by wedge-shaped incision. Fundus of gall-bladder also removed. Large number of gall-stones removed and cholecystenterostomy performed. Complete and perfect recovery. Patient in excellent health at the present time, over four years subsequent to operation.

Microscope showed disease removed to be cancer.

CASE 330.—*Excision of Cancer from Liver, Gall-bladder, and Pylorus—Recovery.*—A woman, aged sixty-three ; history of pain and jaundice ; great loss of flesh and strength ; tumour in gall-bladder region.

*Operation, August 10, 1900.*—Mass of growth discovered in liver, gall-bladder, and pylorus. Cholecystectomy, pylorectomy, and partial hepatectomy performed. Good recovery. Patient well and in good health now.

Microscopic examination showed the disease to be cancer.

But these are exceptional cases, as there were no secondary manifestations of disease in the liver or elsewhere. Had

there been such, I should have simply concluded the operation as an exploratory one.

The following case is an example of the cautery operation, under the care of Dr. W. J. Mayo, of Rochester, Minn. :

Mrs. E. R., aged sixty-five, was admitted to St. Mary's Hospital, Rochester, Minn., April 18, 1900.

*History.*—She has been in her usual health until within the past six months. During this time she has suffered from a boring pain in the right side, which has of late become almost constant. Stomach symptoms have been of moderate severity. There has been some loss of appetite and constipation, with a decrease of 15 pounds in weight. Neither jaundice nor history of colic. Examination reveals a somewhat movable tumour in the right hypochondriac region, evidently connected with the liver. The mass has a nodular feel.

*Operation, April 21, 1900.*—Exploratory incision. A carcinomatous gall-bladder involved the adjacent portion of the liver and the cystic duct. There was some infiltration along the common duct, and extending to the duodenum at one place was a considerable area of adhesions. A few glands in the angle between the cystic and hepatic ducts were infected. The disease was so definitely circumscribed, with such slight glandular involvement, that its removal was decided on. The excision was begun at the common duct, 2 inches of which was removed with 1 inch of the hepatic duct. The vessels were caught and tied as divided; an area of adherent duodenum the size of a silver dollar was included in the excision. The opening in the intestine was closed by circular purse-string sutures. The lower end being thus freed, the gall-bladder with the attached liver was removed with the Paquelin cautery knife. The larger vessels were grasped with forceps. The free venous oozing from the liver substance was not controlled by the cautery, although easily checked by slight pressure, the blood current being of little force. A piece of sterile gauze the size of the wrist was placed in the cavity, and a continuous suture of fine catgut was run through the liver substance on each side of and around the gauze, compressing the bleeding liver margins against it, and controlling the hæmorrhage efficiently. The

portal vein was exposed to a considerable extent in the bottom of the cavity. Adequate drainage was afforded, the bile being conducted to the surface. Recovery was uneventful. The gall-bladder contained a single stone  $\frac{3}{4}$  inch in diameter.

*For benign neoplasms* complete cholecystectomy has rarely been undertaken. Terrier gives three cases by Adler, Ricard, and Rontier, all of which recovered. In all these cases the tumours were cystic or inflammatory, and associated with gall-stones.

In one case of complete cholecystectomy under my care the growth, which was thought to be a neoplasm, turned out on microscopic examination to be inflammatory (Case 234).

The following is an example of cholecystectomy for the removal of a calcareous gall-bladder :

CASE 375.—Mrs. W., aged fifty-seven, seen with Dr. M., of Bolton, for repeated attacks of biliary colic, associated with jaundice of three weeks' standing and rapid loss of flesh.

*Operation*, June 8, 1901, when a gall-stone was found in the common duct, and one in a calcareous gall-bladder the shape and size of a hen's egg. Choledochotomy and cholecystectomy were performed and followed by a smooth recovery, the patient being quite well in September, 1901.

*Simple cholecystectomy* may be performed by three different methods, it being an important proviso that the common duct is cleared of concretions and freely patent.

It may be completely taken away by dissecting it from its bed or by shelling it out, the cystic duct being used as a pedicle and ligatured. When the gall-bladder is very much contracted this is both easy and safe, as the attachments to the liver are readily dissected off without tearing the liver substance. A method of treating the pedicle, otherwise the cystic duct, which I have found effectual, but which, to the best of my belief, has not been adopted by others, is worth mentioning. The duct is seized with strong pressure forceps and crushed, thus making a groove in which the ligature, preferably of catgut, lies quite snugly. Any vessels that bleed are ligatured, and as a matter of precaution (for the parts being dealt with are necessarily infected) a strip of

iodoform gauze is left in contact with the end of the ligatured duct, and brought to the surface through a split drainage-tube. The following case affords an example :

CASE 22.—*Removal of Gall-stone—Persistent Fistula—Cholecystectomy—Recovery.*—Mrs. S. G., aged forty-nine, operated on in 1888 for gall-stones (when sixty-six small ones were removed from a contracted and ulcerated gall-bladder and cystic duct), was left with a mucous fistula, which had to be kept open by a tube, as if it was allowed to heal pain and fever resulted. On May 14, 1890, a further operation was performed, when the gall-bladder was found shrivelled and adherent and the cystic duct was strictured. The operation of cholecystectomy was performed, and a complete recovery resulted, the patient being well when heard of several years later.

The second method is applicable to cases where the gall-bladder is larger, but in which it is so seriously damaged as to be unsafe to leave it, or in cases where, owing to impaction of a concretion in the cystic duct, ulceration has occurred, and may be followed by stricture, which would both prevent the gall-bladder performing its function as a reservoir for bile, and might lead to an accumulation of mucus and the formation of a tumour.

In this case the attachment to the liver is considerable, and if the gall-bladder be fully detached, laceration of the liver and troublesome bleeding are apt to occur, which can be saved by making a longitudinal incision through the serous and fibrous coats on each side of the liver attachment, when the bulk of the gall-bladder and all the mucous membrane can be removed, necessitating only ligature of branches of the cystic artery in the small portion of the fibrous coat left attached to the liver. The cystic duct may then be ligatured, as described in the last operation, or plugged with a gauze drain, or drained by the insertion of a tube which is surrounded by a purse-string suture, so as to prevent leakage of bile. The following cases afford examples :

CASE III.—*Cholecystectomy—Recovery.*—Mr. M., aged forty-six, seen with Dr. R., of New York, and Dr. G., of Nice, for frequent seizures of intense pain resembling biliary colic, with irregular fever and great loss of flesh and strength.



At the operation on May 2, 1895, I found an inflamed and contracted gall-bladder, with cholangitis and extensive adhesions, doubtless due to gall-stones that had passed. After opening the gall-bladder and clearing away muco-pus, the organ was excised in the way just described, and the duct was plugged with gauze brought to the surface through a tube. Recovery was uninterrupted, and he was able to sail at the month end. Nine months later he was in perfect health.

CASE 299.—*Gangrene of Gall-bladder—Partial Cholecystectomy—Recovery.*—Mr. M. A., aged fifty, seen with Dr. A., of York, January 10, 1900, for acute local peritonitis of a week's duration, starting in the region of the gall-bladder, and ushered in by a rigor, followed by fever and intense pain and prostration, the first symptom of pain in the gall-bladder region having only been noticed a month previously.

The operation was performed the same day, when gangrene of the fundus of the gall-bladder was discovered, with intense local peritonitis, limited by acutely inflamed and darkened omentum, the patient being a very fat subject. Cholecystectomy performed; the portion attached to the liver was left, as it was not gangrenous. A tube was inserted into the cystic duct. He made an uninterrupted recovery, and is now in excellent health.

Dr. W. Mayo, of Rochester, U.S.A., suggested another method of partial cholecystectomy which he has found of service. He lays open the gall-bladder and shells out the mucous membrane, if possible in one piece, plugging the cavity remaining with gauze. In some cases this is easy, but in others, where there has been much inflammatory disturbance, I have found it impracticable.

In certain cases of greatly enlarged and in hourglass-shaped gall-bladder the cyst may be considerably reduced without performing complete cholecystectomy, this being effected by excising the redundant portion, ligaturing the branches of the cystic artery, and inserting a drainage-tube, which is fixed in by a purse-string suture, the edges of the portion of gall-bladder remaining being fixed to the aponeurosis of the abdominal wall. This is a less severe operation

than complete cholecystectomy, and if the ducts are clear it answers equally well. (Case 468.)

After cholecystectomy, in the case of a dilated cystic duct, where the ultimate patency of the common duct is questionable, the open end of the duct may be connected to the bowel by choledochenterostomy, as in Case 121.

Unless there be oozing, or unless the wound has been infected by pus or gall-bladder secretion, drainage may perhaps be thought unnecessary; but the adage, 'When in doubt, drain,' is a good one, and it can do no harm to leave an efficient drainage-tube in the right kidney pouch for twenty-four or forty-eight hours after extirpation of the gall-bladder. Packing with iodoform gauze in some cases is better than using a tube, as it serves the double purpose of arresting oozing and acting as a drain.

*Statistics.*—Martig (*Centralbl. für Chir.*, April 14, 1894) collected 87 cases of cholecystectomy, with 12 direct and 3 indirect deaths, thus giving a mortality of 17·24 per cent.; Kehr, 21 cases, with 1 death, giving a mortality of 5 per cent., but in his later statistics the mortality in sample cases is only 3·1 per cent. Mayo, in the Report of the Rochester Hospital, Minnesota, for 1902, gives 31 cases with 3 deaths, a mortality of 9·6 per cent., and on May 21, 1903, he reported 70 cases with 3 deaths, a mortality of 4·3 per cent.

Terrier (*Chirurgie du foie et des voies biliaires*, 1901) gives 16 cases collected from various sources, with 4 deaths.

Délagènière collected 38 cases of cholecystectomy, with 9 deaths, thus giving a mortality of 23 per cent.

Courvoisier collected 47 cases, of which 10 died directly as the result of operation, and 2 indirectly from the operation, giving a mortality of 25·5 per cent.

I have performed the operation 28 times, with 4 deaths, giving a mortality of 14·2 per cent., this including both simple and malignant cases, but in the absence of malignant disease the mortality of the operation has been 6·2 per cent.

Cholecystectomy has hitherto undoubtedly been a more serious operation than cholecystotomy, but since the method of complete exposure of the operation area has been adopted, it has been rendered both easier and safer.

## CHAPTER XIII

### CHOLECYSTENTEROSTOMY

CHOLECYSTENTEROSTOMY consists in establishing an artificial opening between the gall-bladder and duodenum, jejunum or colon, preferably the first, when it may be termed cholecyst-duodenostomy.

Although the conception of the operation occurred independently to Harley, Gaston, and Nussbaum, the first operation was actually performed by Winiwarter, of Liége, in 1880, and my own case, in 1889, was the first operation performed in England, and was the first cholecystenterostomy for biliary fistula.

In its place it is an extremely useful operation, but, as it leaves the cause of the obstruction unremedied, it ought not to be resorted to in obstruction from gall-stones except occasionally, where a more radical operation is impracticable or inadvisable.

Dr. Murphy, of Chicago, in a paper before the International Medical Congress at Rome, favoured the procedure before other methods, and gave the following as the indications for its performance :

1. In all cases where it is desirable to drain the gall-bladder for accumulations therein.

2. In all cases of occlusion of the ductus choledochus.

3. In all cases of cholelithiasis where obstruction of the duct is present, or where the reflex disturbances of digestion are marked.

4. In all cases of cholecystitis, either with or without gall-stones.

5. In all chronic discharging biliary fistulæ, either following operations or as sequelæ of pathological changes.

6. In all cases of perforation of the common duct when it is necessary to obliterate the duct in the reparative process.

And the following as contra-indications :

1. In all cases in which the gall-bladder is too small for the insertion of the button.

2. When the adhesions are so extensive that the bowel cannot be brought in contact with the gall-bladder without kinking.

3. In obliteration of the ductus cysticus, with enormously enlarged non-adherent gall-bladder.

In these cases cholecystectomy should be performed.

Our own conclusions are that the operation is indicated—

1. In biliary fistulæ depending on stricture in, or other permanent occlusion of, the common duct.

2. Very occasionally in cancer of the head of the pancreas, or malignant tumour of the common duct leading to chronic jaundice and distended gall-bladder, for in such cases the mortality will necessarily be so high that the justifiability of the operation is questionable.

3. Very occasionally in impaction of gall-stones in the ducts, where the common bile-duct cannot be freely exposed, and the patient is not in a fit condition to bear the more prolonged operation of separating adhesions, and crushing or removing the concretion by choledochotomy.

*Contra-indications.*—1. In any obstruction of the bile-ducts which can be cleared away with reasonable probability of success.

2. In malignant disease of the head of the pancreas or common bile-duct leading to distension of the gall-bladder the mortality is so great that it is hardly worth incurring the risk, unless the patient be in very good condition.

3. In contracted gall-bladder where it is impracticable to insert the button or bobbin.

4. In very large gall-bladder with obstruction of the cystic duct, where cholecystectomy should be done.

The operation may be performed—

(a) By means of simple suture.

(b) By means of the decalcified bone bobbin.

(c) By means of Murphy's button.

The operation of cholecystenterostomy is performed through the same incision as is made for cholecystotomy, and after the gall-bladder has been aspirated and the intestine clamped, the junction is effected. If sutures be employed, a semicircle of interrupted silk stitches is inserted to unite the contiguous serous surfaces of the gall-bladder and gut; the viscera are then opened, and the mucous margins of the two openings are united by interrupted catgut stitches,

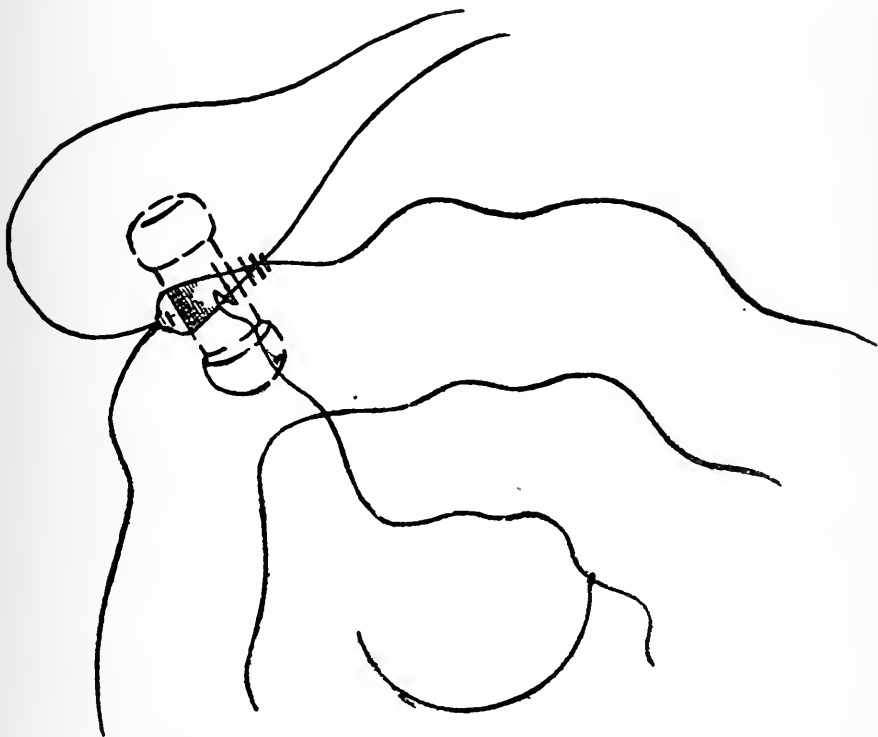


FIG. 69.—DIAGRAM TO SHOW APPLICATION OF MUCOUS OR MARGINAL SUTURE IN THE BONE BOBBIN OPERATION.

after which the circle of catgut stitches and then the circle of serous sutures is completed.

If the bone bobbin be used, two continuous sutures only are employed: a silk stitch to unite the serous surface  $\frac{1}{3}$  or  $\frac{1}{2}$  inch from the visceral openings, and a catgut suture to join the mucous margins of the visceral openings.

For convenience, the posterior semicircle of the serous suture is first applied, and the needle laid aside for a moment, but not unthreaded; the openings are then made, and the posterior half of the mucous suture is inserted. The bobbin

is then introduced, and the mucous suture continued around until it meets the other end of the catgut, when the two ends are tied and cut off short; the serous suture is then carried around the anterior half until it reaches the point where it began, when the two ends are drawn on and tied. (Figs 69 and 70.) The bobbin keeps open the lumen until it is dissolved, in two or three days, and the mucous and serous sutures effectually protect the channel from leakage.

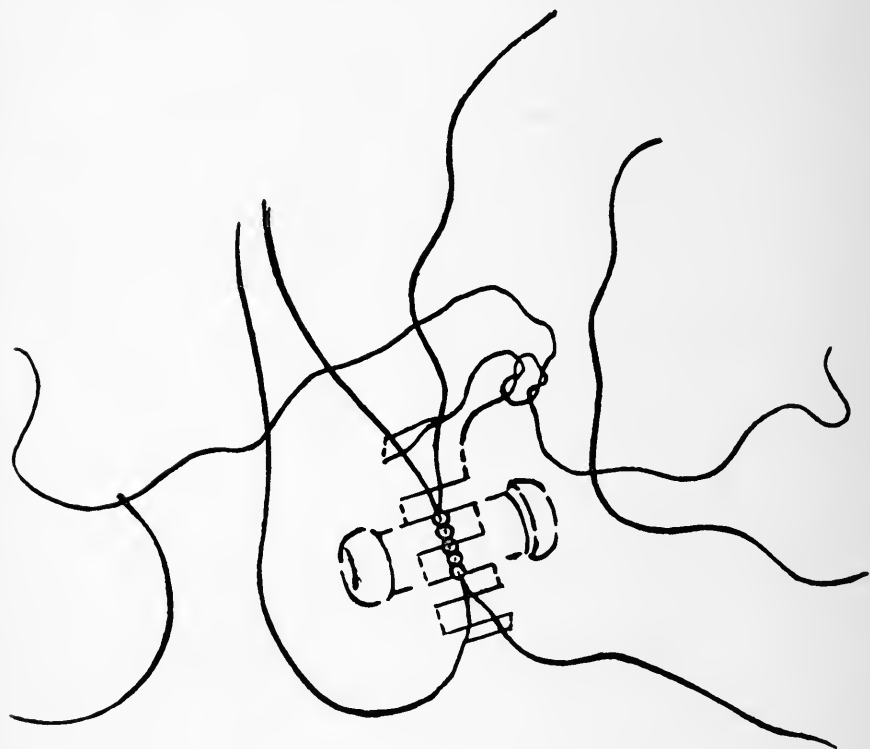


FIG. 70.—DIAGRAM TO SHOW APPLICATION OF SEROUS SUTURE IN THE BONE BOBBIN OPERATION.

If the Murphy button be used, a small size is selected, and two running sutures are applied, as shown in the diagram. After the gall-bladder has been emptied, and the bowel clamped either by intestinal clamps or by a simple elastic tourniquet, the openings are made in the viscera just sufficiently large to admit the separate ends of the button. The threads are then drawn on and tied around the central barrel of the button (Figs. 71 and 72), after which the two ends of the button are approximated and pushed home firmly. The anastomosis is then complete.

The whole process occupies a very short time, and is really very simple. It is, however, necessary to bear in mind that the button has to separate, by causing the approximated margins of the openings to slough, and that the true bond of union is only slight at first, so that it is well to keep the

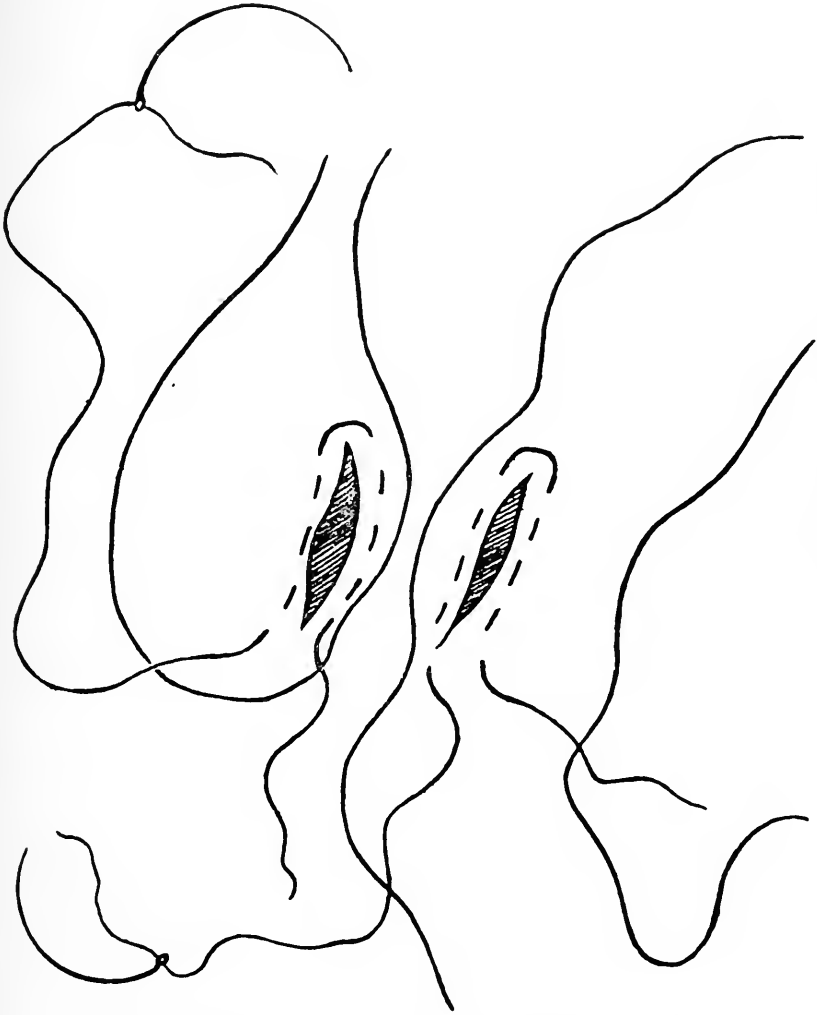


FIG. 71.—FIRST STAGE OF THE BUTTON OPERATION.

patient absolutely quiet for at least a fortnight, lest the new bond of union should give way and permit of extravasation of the visceral contents. In malignant cases, where union is often delayed, there is always a feeling of uncertainty attending the employment of the Murphy button until a full fortnight has elapsed. In considering the question of cholecystenterostomy, it has to be borne in mind that the operation

can only be done when the gall-bladder is of moderate size, or dilated, and that it is inapplicable to the difficult class of cases where a gall-stone is in the common duct and the gall-bladder is atrophied. When it can be done, the anastomosis should be made to the duodenum, but if preferred, a free loop of jejunum may be selected and brought over the hepatic flexure of the colon. In some cases where we have made the

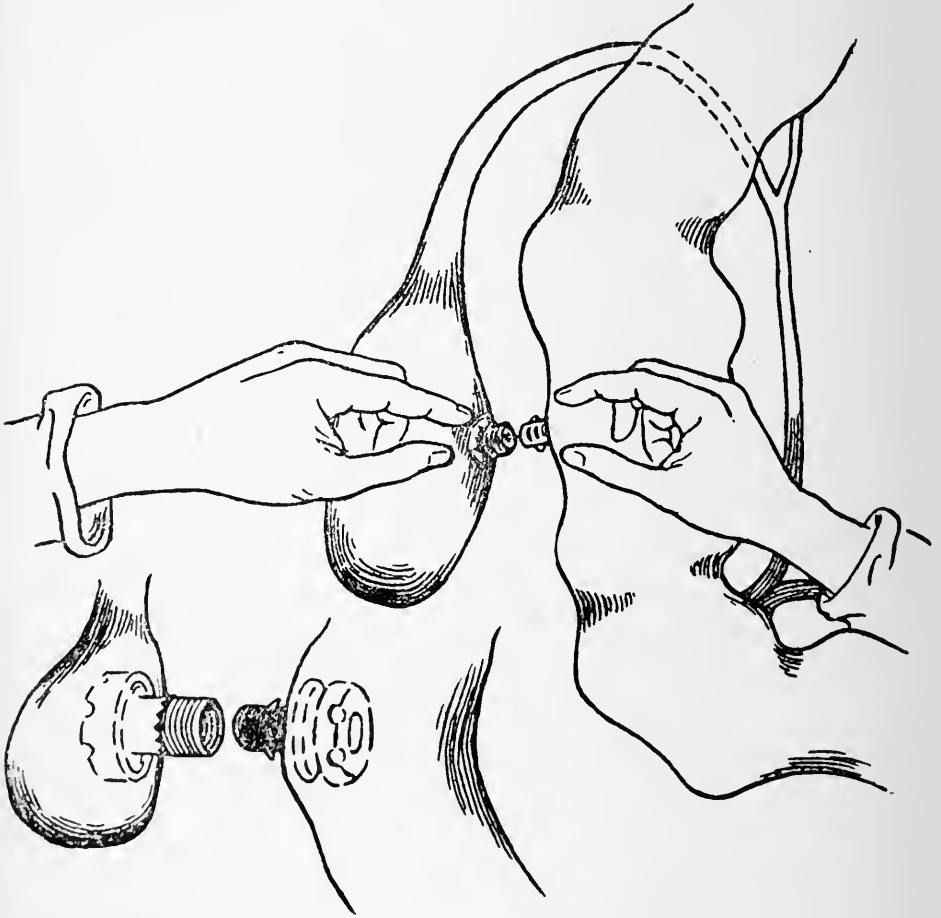


FIG. 72.—LAST STAGES OF THE BUTTON OPERATION.

anastomosis between the gall-bladder and the colon, the result has been quite as satisfactory as if the gall-bladder and duodenum had been joined; and as the operation of joining the gall-bladder and colon is so much simpler than that of joining the gall-bladder to the duodenum, and in cases of biliary fistula may often be done without actually opening the peritoneum, we are inclined to favour the colic anastomosis.



The following is a description of a case of gall-bladder colon operation.

CASE 13.—*Cholecystotomy—Biliary Fistula—Stricture of Common Duct—Cholecystenterostomy—Recovery.*—On January 9, 1888, a married woman, aged forty-two, was admitted to the Leeds General Infirmary, suffering from acute local peritonitis, with a tumour in the region of the gall-bladder.

On January 14 laparotomy was performed through the upper part of the right linea semilunaris, and 8 ounces of fetid pus removed from the gall-bladder. Exploration of the ducts by the finger and a probe failed to discover any gall-stones. The gall-bladder was stitched to the abdominal wound and drained, and the patient made a good recovery, but with a biliary fistula. Although she had retained good health during the fifteen months when the fistula was open and discharging the whole of the bile, her condition was a very miserable one, since no apparatus could be made to catch the overflowing fluid when she was walking about, and her dressings and clothes became saturated.

Cholecystenterostomy was performed on March 2, 1889, by reopening the abdomen through the old cicatrix in the right linea semilunaris. The viscera in the neighbourhood were found to be so matted together that it seemed to be impossible to fix the gall-bladder to the duodenum; and as the hepatic flexure of the colon was conveniently near, the gall-bladder was fixed to it by a double row of sutures round a decalcified bone bobbin, a free communication being made between the two viscera. After a tardy convalescence, she completely recovered, and was well in every respect ten years later.

Cholecystenterostomy has been advocated by some surgeons for obstruction in the common duct by gall-stones, the gall-bladder being connected to the duodenum or colon. In my earlier practice I performed this operation, but since adopting the easy and effectual method of exposing the whole length of the bile-ducts I have practically discarded cholecystenterostomy, for it leaves the cause untouched, and should the artificial opening close, the symptoms inevitably return, as in the following case :

CASE 287. — *Chronic Pancreatitis with Gall-stone in the Common Bile-duct—Cholecystenterostomy—Relief—Relapse.*—A man, aged forty-five, from Queensbury, was admitted into the Leeds General Infirmary, under my care, on November 3, 1899, suffering from jaundice, with repeated attacks of pain and ague-like seizures. He had been well up to thirteen months before his admission, when the attacks began, and since their onset he had lost 6 stones in weight. Jaundice followed the first seizure and persisted, but after each attack of pain it was more intense. He was so weak and ill that it was feared he could not bear operation. An enlargement of the right lobe of the liver could be felt, and on its inner side in the mid-line just above the umbilicus there was another tumour situated behind the stomach. On November 9, an operation was performed on a heated table with the patient enveloped in wool, an injection of 10 minims of solution of strychnia having been previously given. On opening the abdomen an enlargement of the right lobe of the liver was seen, the gall-bladder was found shrunken under adhesions, a floating gall-stone too hard to crush was felt in the common duct, and a hard nodular tumour of the head of the pancreas was discovered. As the latter was thought to be malignant, and the patient was extremely feeble, choledochotomy was not performed, but the gall-bladder was connected to the duodenum by a Murphy's button, in order to give temporary relief to the jaundice, fever, and pain. He had a severe rigor on the night of operation, but afterwards progressed satisfactorily and recovered from the operation. The button passed on the twelfth day, and as he had gained some weight and was taking his food well, it was thought that the operation was going to be of real benefit to him. The subsequent history of the case was as follows :

On December 8 (a month and a day after operation) he had a feeling of chilliness, and a temperature of 101° F. followed for two days, his temperature being afterwards normal for twelve days, when he had a rigor and a return of the jaundice ; from this time, although he got up every day, he gradually became weaker, and in January, 1900, he developed bronchitis, which ushered in the final scene. At

the post-mortem examination the peritoneum was found to be free from inflammation, and the gall-bladder was found to be connected to the duodenum  $1\frac{1}{2}$  inches beyond the pylorus, but the opening had contracted so that it would only admit a fine probe. The common bile-duct was dilated and ulcerated, and it contained a gall-stone the size of a filbert. The liver was considerably enlarged, and the right lobe was occupied by an abscess containing thick, slimy muco-pus. The walls of the abscess cavity were ragged and ill-defined, and it reached nearly to the surface both in front and behind. It was doubtless the result of the suppurative cholangitis which was present. The pancreas was much indurated about the head, and, together with the indurated tissues in the small omentum, gave on palpation the sensation of a tumour. On section it presented to the naked eye the appearance of chronic inflammation rather than growth, and on microscopical examination this view was confirmed, there being a great excess of interstitial fibrous tissue, but no sign of cancer.

The statistics, according to Murphy, given in the *Transactions* of the International Congress at Rome, were :

23 cases by suture, with 8 deaths = 34 per cent.

21 cases for gall-stone by button, no deaths.

2 cases for malignant disease, with 2 deaths = 100 per cent.

From a report up to 1897, which Dr. Murphy was so kind as to furnish, cholecyst-duodenostomy had been performed with the aid of the anastomosis button in 67 non-malignant cases, with only 3 deaths, these being due to continuous hæmorrhage from laceration of the liver substance on the seventh day, to cholæmia on the fourth day, and to septicæmia on the fourth day, respectively. Of his 12 malignant cases 10 died, giving a mortality of 83·3 per cent.

My own cases are 25 in number, with 6 deaths. Of these, 17 were done for gall-stones, chronic pancreatitis, or fistula, and all recovered ; 7 for malignant disease, with 5 deaths ; and 1 for suppurative cholangitis, in which case the patient died.

W. H. Mayo reports 5 cases for chronic pancreatitis, all of which recovered, and 4 for cancer, with 1 death.

### Choledochostomy.

Choledochostomy is the term applied to the direct surface drainage of a dilated bile-duct, an operation which I frequently perform as part of the technique of choledochotomy, and which is very successful; but there is a class of cases where the common duct attains a very large size (see p. 195), which probably also indicates corresponding changes in the ducts within the liver, and the treatment of which is not very satisfactory. Terrier has described four cases (*Revue de Chirurgie*, February, 1893); Dr. Arnison, of Newcastle, had a fifth under his care, and a specimen from a sixth will be found in Guy's Museum, all ending fatally within a few days or weeks of operation, owing to associated choledochitis and infection of the bile channels in the liver itself.

The following cases which recovered are therefore of interest as showing that the operation is not of necessity fatal.

In July, 1896, I performed choledochostomy on a man of twenty-five, after crushing and removing a gall-stone the size of a hen's egg, situated at the junction of the cystic and common ducts. The gall-bladder being much smaller than the duct, it was found easier to fix and drain the latter. The patient made a good recovery (Case 150). I have, since the above, had other successful cases of drainage of the dilated common duct; Case 511 is an example.

**Choledochenterostomy.**—Where it is impossible to clear the ducts, instead of performing choledochostomy, the operation of choledochenterostomy may be done, the union of the dilated duct to the duodenum being made by means of a decalcified bone bobbin or a Murphy's button. Case 526, reported in the Appendix is a good example, and the operation has also been done successfully by Drs. Sprengel and Riedel, and by Dr. Swaine.

In some cases, the shrunken and diseased gall-bladder can be removed, and the end of the dilated cystic duct fixed to the bowel by a Murphy's button (as in Case 121), or by a bone bobbin (as in Cases 55 and 226). It will not usually be necessary to employ drainage. In Case 250 laceration of the liver occurred in separating adhesions, and although the

laceration was sutured, hæmorrhage occurred into the peritoneum, with extravasation of septic bile, though no laceration of the ducts could be found, and the new artificial opening appeared to be perfectly sound.

The following case is an example of cysto-dochenterostomy:

CASE 121.—*Mucous Fistula—Cholecystectomy—Choledochenterostomy—Recovery.*—Mr. P., aged fifty-five, seen at the Leeds Infirmary, July 24, 1895. Operation undertaken for closing a mucous fistula, when the gall-bladder was found to be forming a tumour with walls  $\frac{1}{2}$  to  $\frac{3}{4}$  inch thick. Cholecystectomy was performed, and the open end of the cystic duct connected to the small bowel by means of a Murphy's button. A smooth recovery followed, and when heard of in 1896 he was completely cured and in good health.

CASE 511.—*Dilated Common Duct—Chronic Pancreatitis—Cholecystotomy—Choledochostomy.*—Miss F., aged twenty-eight, seen with Dr. Griffiths, Swansea. Four years previously she had typhoid fever, and had never been well since; a year previously she had an attack of pain followed by jaundice and some enlargement of the gall-bladder. She was operated on by Dr. Griffiths in June, 1902; no gall-stones were found, but the head of the pancreas was much enlarged. The gall-bladder was drained, and the wound healed within the month. The patient was well up to March, 1903, when she had a recurrence of the jaundice, with sickness, retching, and pain; she became very ill, and lost flesh rapidly. When we saw her together there was some enlargement of the gall-bladder, and a distinct cystic swelling over the pancreas. Pancreatic crystals found in urine.

*Operation, June 4, 1903.*—Inflamed and distended gall-bladder; large cyst on the inner side of the gall-bladder containing bile and pus—probably a dilated common bile-duct; finger passed into the cyst reached behind the stomach and duodenum; drainage of the gall-bladder and of the cyst.

*After-History.*—Patient made a good recovery from the operation and returned home, but it was not considered wise to leave out the tubes, and subsequently a further operation was necessary (Case 526).

CASE 526.—*Chronic Pancreatitis—Dilated Common Bile-duct—Cholecystitis—Cholecystectomy—Choledochenterostomy.*—Miss F., aged twenty-eight, seen with Dr. Griffiths, Swansea. Since the former operation there had continued to drain away from the tube into the dilated common bile-duct 20 to 30 ounces of bile. No bile entered the bowel, and from the tube leading into the gall-bladder from 4 to 6 ounces of clear mucus drained away each day. The patient was thin and feeble, had no appetite for food, and was unable to digest anything beyond a little milk. An examination of the urine showed the absence of albumin and sugar, but the presence of pancreatic crystals, which dissolved in from three-quarters to one minute. The fæces contained fat and muscle fibre. An examination of the bile by Dr. Eastes was reported to contain numerous bacilli, which proved to be the *Bacillus enteritidis* of Gartner.

*Operation, October 8, 1903.*—Head of pancreas found to be enlarged, but no concretion was felt in it or in the common bile-duct. Gall-bladder completely excised, the cystic duct being ligatured; the dilated common bile-duct was then connected to the duodenum by means of a decalcified bone bobbin, and the wound was closed. The same evening the patient expressed herself as feeling hungry for the first time since her illness, this apparently being dependent on the bile and pancreatic fluid entering the intestine. She straightway began to absorb whatever nourishment was taken, had her bowels moved on the second day, gained strength, resumed her natural colour, and made such a rapid convalescence that she returned home within the month, having gained 7 pounds in weight since the operation.

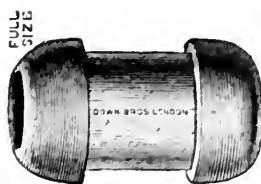
DECALCIFIED BONE BOBBINS, AS MADE FOR THE AUTHOR BY  
MESSRS. DOWN BROS.



No. 1.



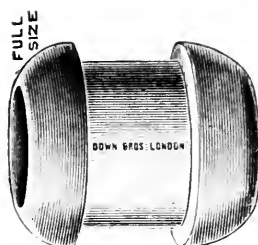
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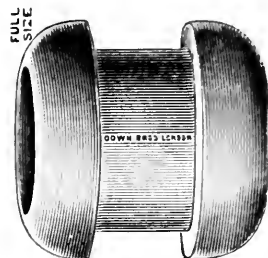
No. 3.



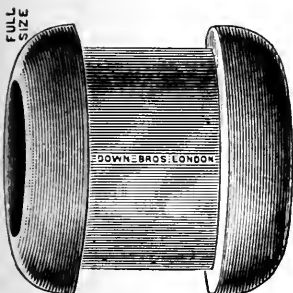
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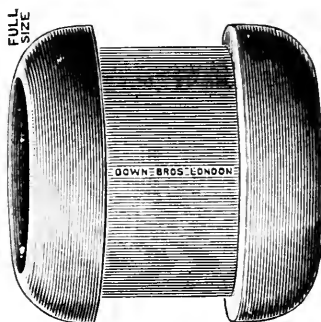
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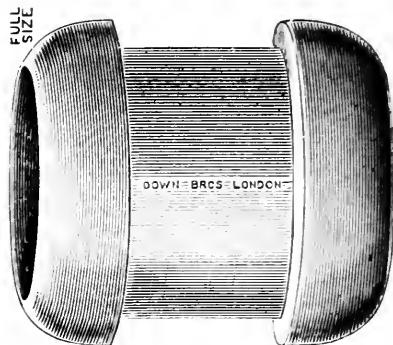
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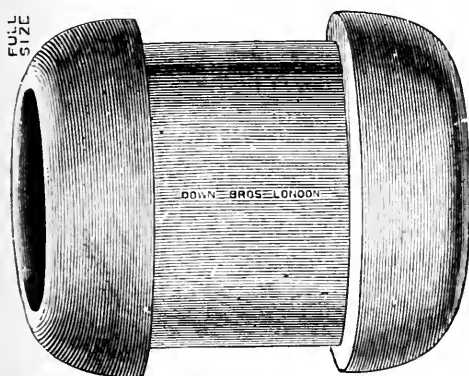
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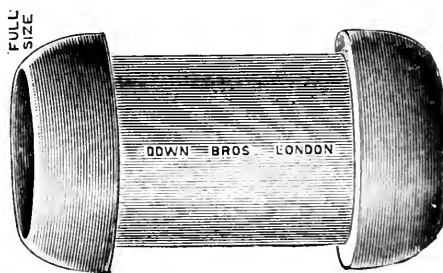
No. 8.



No. 9.



No. 10.



No. 11.

FIG. 73.

No. 1 is the size that may be employed for repairing the bile-ducts.  
Nos. 2, 3, and 4 are the sizes used for Cholecystenterostomy and Choledochenterostomy.  
Nos. 5, 6, 7, and 8 are employed in Gastro-enterostomy and Enterostomy.  
Nos. 9 and 10 in Colectomy, and No. 11 in Pyloroplasty.





# APPENDIX



# APPENDIX

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## LIST OF CASES.

### *Gall-stones : Cholecystotomy.*

CASE 1.—Mrs. F., aged thirty-three, seen with Mr. Wheelhouse.

*Operation.*—21/6/1884. Cholecystotomy; distended gall-bladder; twelve gall-stones removed.

*After-History.*—Patient made a good recovery. Small mucous fistula. In good health, 1902.

### *Gall-stones : Cholecystotomy ; Subsequent Cholecystectomy.*

CASE 2.—Miss L., aged twenty-two, seen with Dr. Churton.

*Operation.*—20/7/1885. Cholecystotomy; distended gall-bladder; sixty gall-stones removed.

*After-History.*—Recovery. Mucous fistula for a time, cured by cholecystectomy. In good health, 1895.

### *Gall-stones, Jaundice : Cholecystotomy ; Subsequent Cholecystenterostomy.*

CASE 3.—Mrs. B., aged forty-two, seen with Dr. Loe. Gall-stones, jaundice present.

*Operation.*—14/1/1888. Cholecystotomy; empyema of gall-bladder.

*After-History.*—Recovery. Biliary fistula, cured by cholecystenterostomy. Ultimately quite well and in good health, 1898.

### *Gall-stones : Cholecystotomy.*

CASE 4.—Mrs. C., aged forty-four, seen at infirmary.

*Operation.*—19/3/1888. Cholecystotomy; fourteen gall-stones removed.

*After-History.*—Good recovery.

*Gall-stones : Cholecystotomy.*

CASE 5.—H. F., female, aged thirty-two, seen at infirmary.

*Operation.*—2/5/1888. Cholecystotomy; forty-two gall-stones removed.

*After-History.*—Good recovery.

*Gall-stones, Empyema of Gall-bladder, Abscess of Liver, Infective Cholangitis : Cholecystotomy.*

CASE 6.—G. T., female, aged forty, seen with Dr. Churton. Infective cholangitis, jaundice.

*Operation.*—14/6/1888. Cholecystotomy; two large gall-stones removed; empyema of gall-bladder and abscess of liver.

*After-History.*—Recovery. Mucous fistula; otherwise well.

*Gall-stones : Cholecystotomy ; Cholelithotri<sup>t</sup>ty.*

CASE 7.—S. T., female, aged thirty-one, seen at infirmary. Tumour of gall-bladder, two years.

*Operation.*—15/6/1888. Cholecystotomy and cholelithotri<sup>t</sup>ty; one large gall-stone removed from gall-bladder, one crushed in cystic duct.

*After-History.*—Good recovery.

*Gall-stones : Cholecystotomy.*

CASE 8.—E. J., female, aged forty, seen at infirmary.

*Operation.*—9/7/1888. Cholecystotomy; distended gall-bladder; two large gall-stones removed.

*After-History.*—Complete recovery.

*Gall-stones, Jaundice : Cholecystotomy.*

CASE 9.—A. H., female, aged forty-two, seen with Dr. A. Atkinson. Slight jaundice.

*Operation.*—29/7/1888. Cholecystotomy; two large gall-stones removed, one from gall-bladder, and one from the junction of cystic and common duct.

*After-History.*—Complete recovery; well three years after.

*Gall-stones : Cholecystotomy ; Subsequent Cholecystectomy.*

CASE 10.—S. G., female, aged forty-nine, seen with Dr. Fletcher Horne, Barnsley.

*Operation.*—29/8/1888. Cholecystotomy; sixty-six gall-stones removed.

*After-History.*—Complete recovery for a time, but ultimately developed stricture of the cystic duct, and required cholecystectomy. (See Case 22.)

*Cancer of Pancreas : Cholecystotomy, Hæmorrhage.*

CASE 11.—Mr. G. B., aged fifty, seen with Dr. Clifford Allbutt. Tumour formed by distended gall-bladder ; intense jaundice ; cancer of pancreas.

*Operation.*—10/9/1888. Cholecystotomy.

*After-History.*—Death ninth day from hæmorrhage and exhaustion.

*Cancer of Common Bile-duct, Suppurative Cholangitis : Cholecystotomy.*

CASE 12.—Mr. W. T., aged forty-two, seen with Dr. Churton. Deep jaundice and suppurative cholangitis ; distended gall-bladder ; cancer of common bile-duct.

*Operation.*—23/12/1888. Cholecystotomy.

*After-History.*—Relief for a time, but death later from progress of disease.

*Biliary Fistula, Stricture of Common Bile-duct : Cholecystenterostomy.*

CASE 13.—Mrs. B., aged forty-four, seen at infirmary. (Sequel of Case 3.)

*Operation.*—2/3/1889. Stricture of common bile-duct ; cholecystenterostomy ; gall-bladder united to colon by sutures. (See p. 117.)

*After-History.*—Good recovery ; quite well in 1898.

*Gall-stones : Cholecystotomy.*

CASE 14.—Mr. C., aged forty-one, seen at infirmary. Distended gall-bladder.

*Operation.*—28/3/1889. Cholecystotomy ; fourteen gall-stones removed.

*After-History.*—Complete recovery.

*Gall-stones : Cholecystotomy.*

CASE 15.—Mrs. H., aged thirty-two, seen with Dr. Clifford Allbutt and Mr. Wheelhouse. Distended gall-bladder.

*Operation.*—2/5/1889. Cholecystotomy ; forty-two gall-stones removed.

*After-History.*—Good recovery.

*Gall-stones, Jaundice : Cholecystotomy ; Cholelithotripsy.*

CASE 16.—Mr. H., aged fifty-five, seen with Dr. Gordon Black, Harrogate. Jaundice.

*Operation.*—7/9/1889. Cholecystotomy ; seventy gall-stones removed, others crushed in common duct.

*After-History.*—Complete recovery ; quite well, 1903.

*Gall-stones : Cholecystotomy.*

CASE 17.—A. W., female, aged forty-one, seen with Dr. Swann, Batley.

*Operation.*—26/9/1889. Cholecystotomy; three gall-stones removed.

*After-History.*—Good recovery; when last heard of quite well.

*Jaundice, Gall-stones : Cholecystotomy.*

CASE 18.—Mrs. F., aged thirty-four, seen with Dr. G. Coleman. Jaundice present.

*Operation.*—10/10/1889. Cholecystotomy; twelve gall-stones removed; shrunk gall-bladder.

*After-History.*—Good recovery; quite well for a time, then had recurrence of symptoms from gall-stones left in common bile-duct. (See Case 37.)

*Gall-stones : Cholecystotomy.*

CASE 19.—Mrs. H., aged thirty-two, seen with Dr. Fairbank, Doncaster. Distended gall-bladder.

*Operation.*—16/1/1890. Cholecystotomy; two gall-stones removed.

*After-History.*—Good recovery; quite well when last seen.

*Gall-stones : Cholecystotomy.*

CASE 20.—G. T., female, aged forty-two, seen at infirmary.

*Operation.*—14/2/1890. Cholecystotomy; one large gall-stone removed.

*After-History.*—Good recovery; quite well when last seen.

*Gall-stones : Cholecystotomy.*

CASE 21.—Mr. R., aged fifty, seen with Dr. Britton, Harrogate.

*Operation.*—5/5/1890. Cholecystotomy; one large gall-stone removed.

*After-History.*—Complete recovery; well when seen in 1897.

*Stricture of Cystic Duct, Mucous Fistula : Cholecystectomy.*

CASE 22.—Mrs. G., aged fifty-one, seen with Dr. Fletcher Horne, Barnsley. Mucous fistula; stricture of cystic duct, following gall-stones. (See Case 10.)

*Operation.*—14/5/1890. Cholecystectomy.

*After-History.*—Complete and permanent cure; well, 1893.

*Gall-stones in Common Duct : Cholelithotripsy and Cholecystotomy.*

CASE 23.—Mrs. C., aged thirty, seen with Dr. Dobson. Jaundice present.

*Operation.*—3/6/1890. Cholecystotomy and cholelithotripsy; several stones crushed in common duct. After seven weeks the common duct was cleared by injecting a solution of turpentine in ether.

*After-History.*—Cure; quite well 1900.

*Gall-stones : Cholecystotomy.*

CASE 24.—Mr. B., aged twenty-nine, seen with Dr. Dearden-Wyke.

*Operation.*—19/6/1890. Cholecystotomy; six gall-stones removed; shrunken gall-bladder.

*After-History.*—Good recovery; quite well, 1892.

*Chronic Pancreatitis : Exploratory Operation ; Separation of Adhesions.*

CASE 25.—Mrs. B., aged forty-two, seen with Dr. Sykes, Cleckheaton. Deep jaundice present; tumour close to common duct, thought to be malignant; extensive adhesions separated.

*Operation.*—22/6/1890. Exploratory.

*After-History.*—Good recovery; perfectly well some months after. In the light of recent knowledge, I suspect this was a case of chronic pancreatitis.

*Gall-stones : Cholecystotomy and Cholelithotripsy.*

CASE 26.—Mrs. P., aged twenty-nine, seen at infirmary. Spasms for years.

*Operation.*—15/8/1890. Cholelithotripsy and cholecystotomy; shrunken gall-bladder, with numerous adhesions; gall-stone crushed in cystic duct.

*After-History.*—Good recovery.

*Gall-stones, Jaundice, Empyema of Gall-bladder, Abscess of Liver : Cholecystotomy.*

CASE 27.—J. E., female, aged twenty-five, seen at infirmary. Jaundice present.

*Operation.*—2/9/1890. Cholecystotomy; gall-stones in gall-bladder, with empyema; also abscess of liver, containing gall-stones (thirty-eight in all).

*After-History.*—Good recovery.

*Spasms : Adhesions around Gall-bladder separated, Gastrolysis.*

CASE 28.—Mr. C., aged twenty-two, seen at infirmary. Five years' history of spasmodic pains in gall-bladder region.

*Operation.*—30/10/1890. Exploratory; adhesions separated.

*After-History.*—Good recovery; quite well some months later.

*Gall-stones in Common Duct, Jaundice, Infective Cholangitis: Cholelithotripsy and Cholecystotomy.*

CASE 29.—Mrs. H., aged thirty, seen with Dr. Squance, Sunderland. Jaundice present; infective cholangitis; persistent vomiting; loss of flesh.

*Operation.*—1/11/1890. Cholecystotomy and cholelithotripsy; one gall-stone removed, several crushed in ducts.

*After-History.*—Good recovery; quite well some months later.

*Volvulus causing Obstruction, Large Gall-stone: Laparotomy.*

CASE 30.—Mrs. E., aged sixty-eight, seen with Dr. Hamilton, Crowle. Gall-stone producing intestinal colic and obstruction, with volvulus of small bowel.

*Operation.*—12/11/1890. Laparotomy and untwisting volvulus; large gall-stone  $1\frac{1}{2}$  inches by 1 inch afterwards passed *per anum*.

*After-History.*—Complete recovery; when heard of a year later was quite well.

*Gall-stone in Common Duct, Jaundice, Infective Cholangitis: Cholelithotripsy and Cholecystotomy.*

CASE 31.—Mrs. W., aged forty, seen with Dr. Purdy, Woodlesford. Jaundice present, and infective cholangitis.

*Operation.*—14/11/1890. Cholelithotripsy and cholecystotomy; large gall-stone crushed in common duct.

*After-History.*—Rapid recovery; well in 1891.

*Gall-stones: Cholecystotomy and Cholelithotripsy.*

CASE 32.—Mr. R., Newhaven, Connecticut, aged thirty-nine, seen with Mr. Wheelhouse.

*Operation.*—29/12/1890. Cholecystotomy and cholelithotripsy; numerous gall-stones removed.

*After-History.*—Rapid recovery. Returned to America within the month. Well in 1893.

*Cancer of Pancreas, Hæmorrhage, Deep Jaundice: Cholecystotomy.*

CASE 33.—Mrs. R., aged forty-five, seen with Dr. Hollings, Calverley. Cancer of pancreas with gall-stones; intense jaundice; hæmorrhage from nose, bowel, etc.

*Operation.*—29/12/1890. Cholecystotomy.

*After-History.*—Death next day. Patient extremely exhausted at the time of operation, which probably did not much shorten life.



*Gall-stones : Cholecystotomy ; Cholelithotrixy.*

CASE 34.—Mrs. W., aged fifty-five, seen at infirmary. Slight jaundice.

*Operation.*—13/1/1891. Cholecystotomy and cholelithotrixy ; gall-stones crushed in cystic duct.

*After-History.*—Cured.

*Gall-stone and Cystic Dilatation of Hepatic Duct in Liver : Removal of Gall-stones and Drainage.*

CASE 35.—Mrs. C., aged forty-two, seen with Dr. Lee, Dewsbury. Jaundice present.

*Operation.*—5/2/1891. Hepatotomy and cholecystotomy. Cyst of liver due to dilated hepatic duct. Incision of duct in liver, about 8 ounces of fluid evacuated, and drainage adopted ; free bleeding controlled by gauze packing ; three gall-stones removed.

*After-History.*—Recovery. Small discharge of bile persisted for a time.

*Chronic Pancreatitis : Exploration ; Aspiration of Gall-bladder.*

CASE 36.—Mr. G., aged fifty, seen with Dr. —, Chatham. Tumour of head of pancreas ; deep jaundice ; distended gall-bladder.

*Operation.*—17/2/1891. Exploratory ; 30 ounces of fluid removed by aspirator. Swelling of head of pancreas, thought to be cancer, but possibly chronic pancreatitis.

*After-History.*—Marked relief for a time. Returned home within the month.

*Gall-stones in Common Duct, Jaundice and Infective Cholangitis : Cholelithotrixy.*

CASE 37.—Mrs. F., aged thirty-five, seen with Dr. Coleman, Hemsworth. Jaundice present.

*Operation.*—26/2/1891. Cholecystotomy and cholelithotrixy ; stones crushed in common duct.

*After-History.*—Good recovery from operation and well for some time, but in 1896 had recurrence, due probably to fragments left. (See Case 539.)

*Gall-stone in Common Duct : Cholelithotrixy ; Cholecystotomy.*

CASE 38.—Mr. L., aged forty-five, seen with Dr. Drake, Headingley. Deep jaundice.

*Operation.*—5/3/1891. Cholecystotomy and cholelithotrixy ; gall-stone crushed in common duct.

*After-History.*—Recovery from operation, but a month later had diarrhœa, and died rather suddenly. Nothing abnormal found in region of bile-ducts; wound had healed.

*Gall-stone in Common Duct, Jaundice : Cholecystotomy ;  
Cholelithotrixy.*

CASE 39.—Mrs. S., aged thirty-five, seen with Dr. Oglesby, York. Jaundice.

*Operation.*—12/3/1891. Cholecystotomy and cholelithotrixy; stones crushed in common duct.

*After-History.*—Good recovery; well, 1896.

*Gall-stone, Jaundice : Cholecystotomy.*

CASE 40.—Mrs. H. M. C., aged forty-two, seen at infirmary. Intense jaundice present.

*Operation.*—19/3/1891. Cholecystotomy; one gall-stone removed  $\frac{3}{4}$  inch in diameter.

*After-History.*—Recovery. After returning home at the month-end contracted influenza, and had fatal pneumonia.

*Gall-stones : Cholecystotomy ; Cholelithotrixy.*

CASE 41.—Mrs. H., aged thirty-two, seen with Dr. Braithwaite.

*Operation.*—23/3/1891. Cholecystotomy and cholelithotrixy; one gall-stone removed; gall-bladder contracted; numerous adhesions.

*After-History.*—Cured; well in 1894.

*Gall-stone : Cholelithotrixy ; Abnormal Position of Gall-bladder.*

CASE 42.—Mrs. R., aged forty, seen at infirmary.

*Operation.*—2/4/1891. Cholelithotrixy; gall-bladder not opened; one stone, the size of a filbert, crushed in cystic duct; gall-bladder displaced considerably to right.

*After-History.*—Good recovery; well, 1894; no recurrence of symptoms.

*Calcified Hydatid of Liver simulating Enlarged Gall-bladder :  
Exploratory Operation.*

CASE 43.—Mr. F., aged fifty, seen at infirmary. Epigastric tumour, with pains over gall-bladder region.

*Operation.*—13/4/1891. Exploratory; calcified hydatid tumour with adhesions found.

*After-History.*—Recovery.

*Gall-stones : Cholecystotomy ; Cholelithotriety.*

CASE 44.—Mrs. S., aged fifty, seen at infirmary.

*Operation.*—7/5/1891. Cholecystotomy and cholelithotriety ; five stones crushed with the fingers and forceps.

*After-History.*—Good recovery.

*Chronic Catarrhal Cholecystitis, Kinking of Bile-duct, Movable Kidney : Cholecystotomy.*

CASE 45.—Mrs. M., aged fifty-nine, seen with Dr. Dobie, Keighley. Distended gall-bladder ; movable right kidney ; chronic catarrh of gall-bladder, with frequent attacks of pain, apparently due to kinking of cystic duct by the movable kidney.

*Operation.*—5/12/1891. Cholecystotomy.

*After-History.*—Good recovery ; there had been no recurrence of symptoms in July, 1893.

*Tumour of Gall-bladder : Exploratory Operation ; Resolution of Tumour.*

CASE 46.—Mrs. R., aged fifty, seen with Dr. Gordon Black, Harrogate. Solid tumour of gall-bladder, thought to be malignant.

*Operation.*—14/1/1892. Exploratory ; exploration by needles after abdomen had been opened.

*After-History.*—Ultimate complete recovery without further treatment.

*Cancer of Liver and Gall-bladder : Cholecystotomy.*

CASE 47.—Mrs. P., aged fifty-six, seen with Dr. McGregor Young, Leeds. Chronic jaundice with attacks of pain over the liver ; hæmorrhagic diathesis.

*Operation.*—1/2/1892. Cholecystotomy ; cancer of gall-bladder and liver found ; chloride of calcium used before the operation ; little bleeding.

*After-History.*—Recovery ; greatly relieved for over a year.

*Gall-stones : Cholecystotomy.*

CASE 48.—H. C., female, aged forty-four, seen with Dr. Stewart, Batley.

*Operation.*—12/2/1892. Cholecystotomy ; eight gall-stones removed from gall-bladder, fifteen from cystic duct.

*After-History.*—Cured.

*Gall-stones : Cholecystotomy ; Cholelithotriety.*

CASE 49.—Mr. O., aged fifty-one, seen with Dr. McGregor, Huddersfield. Jaundice present.

*Operation.*—3/3/1892. Cholecystotomy and cholelithotripsy. Gall-stones crushed in cystic duct.

*After-History.*—Cured.

*Gall-stones, Jaundice : Cholecystotomy ; Cholelithotripsy.*

CASE 50.—Mr. M., aged thirty-seven, seen at infirmary. Jaundice present.

*Operation.*—10/3/1892. Cholecystotomy and cholelithotripsy; gall-stones removed from gall-bladder and cystic duct.

*After-History.*—Recovery. Biliary fistula persisted, but ultimately closed, to reopen after another attack of biliary colic followed by jaundice. (See Case 55.)

*Chronic Pancreatitis : Cholecystotomy.*

CASE 51.—Mr. P., aged thirty-two, seen with Dr. Woods, Killinghall, and Dr. Barrs. Deep jaundice; distended gall-bladder; emaciation; no pain; extremely feeble.

*Operation.*—1/4/1892. Cholecystotomy; no gall-stones; hard swelling of head of pancreas; distended gall-bladder.

*After-History.*—Patient much exhausted and emaciated at the time of operation; almost died under anæsthetic. Died, apparently from shock, on the second day.

Autopsy and microscopic examination showed tumour not to be cancer, but chronic pancreatitis.

*Cancer of Liver : Exploratory Operation.*

CASE 52.—Mr. D., aged thirty-five, seen at infirmary. Malignant disease of the liver; jaundice with pain resembling gall-stones.

*Operation.*—7/6/1892. Exploratory.

*After-History.*—Recovery from operation and returned home.

*Gall-stones in Common Duct : Cholecystotomy and Cholelithotripsy.*

CASE 53.—Mrs. R., aged fifty-six, seen with Dr. Blomfield, Pontefract.

*Operation.*—15/6/1892. Cholecystotomy and cholelithotripsy; gall-stones in gall-bladder and in cystic and common ducts; latter crushed, former removed.

*After-History.*—Cured.

*Adhesions of Pylorus to Gall-bladder : Gastrolysis.*

CASE 54.—Mr. F. T. W., aged eighteen, seen with Dr. Walker, Kirkby Stephen. Recurrent attacks of pain in hypochondrium.

*Operation.*—6/8/1892. Exploratory; extensive adhesions of pylorus to gall-bladder broken down.

*After-History.*—Recovery; gained 2 stones in weight after the operation; well, 1894.

*Biliary Fistula : Cholecystectomy ; Choledochenterostomy.*

CASE 55.—Mr. M., aged thirty-eight, seen at infirmary. Biliary fistula after operation five months previously.

*Operation.*—6/8/1892. Cholecystectomy and choledochenterostomy; dilated cystic duct united to colon by small decalcified bone bobbin.

*After-History.*—Perfectly well for some months, after which jaundice recurred, due to gall-stone left in common duct. (See Case 59.)

*Gall-stones in Common Duct, Jaundice : Cholecystotomy ; Cholelithotrixy.*

CASE 56.—Mrs. T., aged fifty, seen with Dr. Harwood, Burnley. Jaundice nine months; cholangitis.

*Operation.*—29/9/1892. Cholecystotomy and cholelithotrixy; shrunken gall-bladder; gall-stone in contracted bladder and several in cystic and common ducts crushed. Case had been pronounced malignant by a consulting physician, and operation not advised.

*After-History.*—Good recovery; well, 1893.

*Gall-stones in Common Duct, Jaundice : Cholecystotomy.*

CASE 57.—Mrs. E., aged fifty, seen with Dr. Clifton, Sheffield. Jaundice present for ten months; ague-like attacks due to infective cholangitis.

*Operation.*—4/10/1892. Cholecystotomy. Two large gall-stones in gall-bladder, one in common duct removed by scoop. Cancer diagnosed by consulting physician, and operation not advised.

*After-History.*—Good recovery; well, 1893.

*Gall-stones in Common Duct : Cholecystotomy ; Cholelithotrixy.*

CASE 58.—Mrs. P., aged forty, seen at infirmary.

*Operation.*—12/1/1893. Cholecystotomy and cholelithotrixy; six gall-stones removed from cystic duct, several crushed in common duct.

*After-History.*—Recovery. Small biliary fistula persisted, but at times closed. (See Case 73.)

*Gall-stone in Common Duct : Choledochotomy.*

CASE 59.—Mr. M., aged thirty-eight, seen at infirmary. Jaundice present.

*Operation.*—28/1/1893. Choledochotomy; large gall-stone removed from common duct through incision, which was afterwards sutured.

*After-History.*—Fæcal extravasation through small perforation in colon, caused by separating adhesions and unrecognised at the time of operation. Death in second week.

*Gall-stones : Cholecystotomy.*

CASE 60.—Mrs. B., aged thirty-six, seen with Dr. Watts, Dewsbury.

*Operation.*—24/2/1893. Cholecystotomy; six large stones removed.

*After-History.*—Good recovery; well, 1896.

*Gall-stones, Jaundice : Cholecystotomy ; Cholelithotrixy.*

CASE 61.—Mr. O., aged fifty-one, seen at infirmary. Jaundice present.

*Operation.*—3/3/1893. Cholecystotomy and cholelithotrixy; contracted gall-bladder; several stones crushed in common duct.

*After-History.*—Complete recovery; quite well, 1894.

*Gall-stones : Cholecystotomy.*

CASE 62.—A. B., female, aged thirty-seven, seen at infirmary.

*Operation.*—11/3/1893. Cholecystotomy; shrunken gall-bladder; one large stone in cystic duct removed.

*After-History.*—Cured; well when last seen.

*Gall-bladder Colic, Adhesions, Dilated Stomach, Gastrolaxis.*

CASE 63.—Mr. G., aged thirty-nine, seen at infirmary. Dilatation of stomach following on history of gall-stones.

*Operation.*—22/3/1893. Laparotomy and separation of adhesions; no gall-stones found.

*After-History.*—Good recovery; quite well three months afterwards.

*Gall-stones : Cholecystotomy.*

CASE 64.—Mr. H., aged fifty, seen with Dr. Topham, Halifax.

*Operation.*—11/4/1893. Cholecystotomy; 156 gall-stones removed from gall-bladder and cystic duct.

*After-History.*—Cured.

*Mucous Fistula : Cholecystectomy.*

CASE 65.—Mrs. T., aged forty-four, seen at infirmary. Mucous fistula over gall-bladder.

*Operation.*—28/4/1893. Cholecystectomy.

*After-History.*—Perfect recovery ; well, 1894.

*Tumour of Gall-bladder : Exploratory Operation ; Resolution of Tumour.*

CASE 66.—Mrs. T., aged fifty-four, seen at infirmary.

*Operation.*—5/5/1893. Exploratory ; cancer of the gall-bladder ; large, hard nodular tumour yielding only blood to exploring syringe ; every appearance of malignancy.

*After-History.*—Recovery. Wound healed by first intention, and patient reported to be well some years later.

*Gall-stones : Cholecystotomy.*

CASE 67.—Mrs. B., aged forty-four, seen at infirmary.

*Operation.*—6/5/1893. Cholecystotomy ; contracted gall-bladder ; two stones in cystic duct crushed.

*After-History.*—Good recovery ; well when last heard of.

*Gall-stone : Cholecystotomy.*

CASE 68.—Mrs. G., aged forty, seen at infirmary.

*Operation.*—19/5/1893. Cholecystotomy ; gall-stone weighing 112 grains removed from cystic duct.

*After-History.*—Recovery ; perfectly well some months subsequently.

*Gall-stones : Cholecystotomy.*

CASE 69.—Mrs. S. J. R., aged thirty-five, seen with Dr. Taylor, Meadow Lane.

*Operation.*—19/5/1893. Cholecystotomy ; two large gall-stones in cystic and common duct ; gall-bladder contracted.

*After-History.*—Cured ; well in 1895.

*Gall-stone in Common Duct : Cholecystotomy ; Cholelithotripsy.*

CASE 70.—Mrs. S., aged thirty-one, seen with Dr. Scatterty, Keighley. Jaundice present.

*Operation.*—25/5/1893. Cholecystotomy ; stone crushed in common duct.

*After-History.*—Good recovery ; quite well when seen some time after.

*Gall-stones : Cholecystotomy.*

CASE 71.—Mrs. F., aged fifty-four, seen with Dr. Rowe, Leeds, and Dr. Mais, Thorner.

*Operation.*—6/6/1893. Cholecystotomy; distended gall-bladder; three stones removed from the cystic duct.

*After-History.*—Good recovery; quite well, 1894.

*Gall-stones in Common Duct : Cholecystotomy ; Cholelithotrixy.*

CASE 72.—Mr. B., aged fifty-eight, seen at infirmary. Jaundice present.

*Operation.*—20/6/1893. Cholecystotomy and cholelithotrixy; several large stones in cystic and common ducts removed, others crushed.

*After-History.*—Recovery. Bronchitis third week, and patient left the infirmary at his own request, though not well.

*Biliary Fistula : Cholecystenterostomy.*

CASE 73.—Mrs. P., aged forty, seen at infirmary. Biliary fistula.

*Operation.*—31/7/1893. Cholecystenterostomy by decalcified bone bobbin.

*After-History.*—Good recovery; quite well, 1894.

*Gall-stones in Common Duct : Cholecystotomy ; Cholelithotrixy.*

CASE 74.—Mr. G., aged fifty-two, seen at infirmary. Jaundice present.

*Operation.*—24/8/1893. Cholecystotomy; large stone in cystic duct; several crushed in common duct.

*After-History.*—Good recovery; quite well, 1894.

*Gall-stones : Cholecystotomy.*

CASE 75.—Mrs. C., aged thirty-five, seen with Dr. Mackenzie, Douglas, Isle of Man. Jaundice present.

*Operation.*—4/9/1893. Cholecystotomy; twenty-seven gall-stones removed from gall-bladder and cystic duct.

*After-History.*—Complete recovery; well, 1896.

*Gall-stones : Cholecystotomy.*

CASE 76.—Mrs. B., aged forty, seen with Dr. Hodgson Wright, Halifax, and Dr. Ozanne, Harrogate. Distended gall-bladder; slight jaundice.

*Operation.*—26/9/1893. Cholecystotomy; six stones removed from the gall-bladder and cystic duct.

*After-History.*—Good recovery; perfectly well, February, 1895.



*Gall-stones : Cholecystotomy ; Cholelithotriety.*

CASE 77.—K. B., female, aged forty-four, seen at infirmary. Jaundice present.

*Operation.*—28/9/1893. Cholecystotomy and cholelithotriety ; stones removed from the cystic duct, and several crushed before removal ; extensive adhesions.

*After-History.*—Good recovery ; well when last heard of.

*Gall-stones, Intestinal Obstruction ; Cholecystotomy ; Cholelithotriety.*

CASE 78.—Mrs. R., aged fifty-six, seen at infirmary. Jaundice present. (For previous history, see p. 164.)

*Operation.*—21/10/1893. Cholecystotomy and cholelithotriety ; six gall-stones removed and several crushed in the common duct.

*After-History.*—Cured ; well some months after.

*Gall-stones, Fistula : Cholecystotomy.*

CASE 79.—Mrs. C., aged thirty-five, seen with Dr. Walker, Redcar. Sinus discharging bile and pus at umbilicus.

*Operation.*—14/11/1893. Fistula laid open, and eighteen gall-stones, together with pus and mucus, removed from the gall-bladder by cholecystotomy, but because of the suppuration the ducts were not explored.

*After-History.*—Good recovery ; March, 1894, wrote to say very well except for a small mucous fistula. (See Case 109.)

*Gall-stones : Cholecystotomy ; Cholelithotriety.*

CASE 80.—M. A. K., female, aged thirty, seen at infirmary.

*Operation.*—30/11/1893. Cholecystotomy and cholelithotriety ; five gall-stones removed.

*After-History.*—Cured.

*Extravasation of Bile due to ruptured Bile-ducts, Subdiaphragmatic Abscess : Drainage.*

CASE 81.—Mr. P., aged forty-five, seen with Dr. Braithwaite, Leeds. After symptoms of gall-stones for twenty-nine years, acute general peritonitis starting over the gall-bladder.

*Operation.*—12/10/1893. Rupture of bile-ducts and extravasation of several pints of bile, with pus, found at the operation. Laparotomy, lavage, and drainage.

*After-History.*—Perfect recovery ; patient well and at business within two months ; well in 1895.

*Cancer of Liver and Gall-bladder : Exploratory Operation.*

CASE 82.—Mr. E., aged twenty-seven, seen at infirmary, jaundice.

*Operation.*—18/1/1894. Exploratory ; malignant tumour of gall-bladder and liver.

*After-History.*—Recovery from operation.

*Gall-stones : Cholecystotomy.*

CASE 83.—Mrs. C., aged forty-five, seen at infirmary.

*Operation.*—18/2/1894. Cholecystotomy; six gall-stones in gall-bladder, and twenty-three in cystic duct.

*After-History.*—Good recovery; March, 1894, writes to say ‘better than for years.’

*Gall-stones : Cholecystotomy.*

CASE 84.—M. L. S., female, aged thirty, seen at infirmary. Distended gall-bladder, with attacks of pain.

*Operation.*—20/2/1894. Cholecystotomy; gall-stones removed.

*After-History.*—Good recovery.

*Gall-stones : Cholecystotomy.*

CASE 85.—Mrs. L., aged thirty-two, seen with Dr. Macgregor Young, Leeds. No jaundice present.

*Operation.*—3/3/1894. Cholecystotomy; twenty gall-stones removed from gall-bladder and cystic duct.

*After-History.*—Good recovery; well, 1897.

*Gall-stones : Cholecystotomy.*

CASE 86.—Mrs. E., aged thirty-five. Distended gall-bladder; no jaundice present.

*Operation.*—7/3/1894. Cholecystotomy: thirty-five gall-stones removed.

*After-History.*—Good recovery; well, 1897.

*Adhesions, Spasmodic Pain and Vomiting : Gastrolysis.*

CASE 87.—Mr. G., aged thirty-nine. History of cholelithiasis six years before; five years’ history of pain, vomiting, etc.; dilated stomach.

*Operation.*—12/3/1894. Laparotomy; separation of adhesions of pylorus to gall-bladder.

*After-History.*—Complete recovery. Gained 2 stones in weight in three months.

*Intestinal Obstruction, Volvulus, Cholelithiasis : Laparotomy.*

CASE 88.—Mrs. O., aged sixty, seen with Dr. Lownds, Doncaster. Acute intestinal obstruction; volvulus of small intestine after gall-stone seizure. Gall-stone attacks for seven years; acute obstruction five days.

*Operation.*—13/3/1894. Laparotomy; untwisting of volvulus.

*After-History.*—Complete recovery; perfectly well when heard of in June, 1894.

*Gall-stones : Cholecystotomy.*

CASE 89.—Mr. S., aged fifty, seen with Dr. Eddison, Leeds, and Dr. Swann, Batley. Spasms for three years.

*Operation.*—24/5/1894. Cholecystotomy; ninety-six gall-stones removed from the gall-bladder and cystic duct; drainage four days.

*After-History.*—Good recovery; well, 1897.

*Gall-stones, Hourglass Gall-bladder : Cholecystotomy.*

CASE 90.—Mrs. L., aged thirty-nine, seen with Dr. Helm, Sheffield. Ten years' history; no jaundice.

*Operation.*—29/5/1894. Cholecystotomy. Hourglass contraction of gall-bladder; forty-nine gall-stones removed; drainage.

*After-History.*—Complete recovery; well, 1901.

*Jaundice, Abscess with Tumour of Liver : Laparotomy ; Drainage.*

CASE 91.—Mr. P., aged forty-nine, seen at infirmary. Chronic catarrh of bile-ducts and jaundice; recurrent attacks of pain.

*Operation.*—30/5/1894. Laparotomy; tumour of liver (probably soft carcinoma) with suppuration; drainage.

*After-History.*—Left the infirmary improved; sinus remaining.

*Gall-stones, Jaundice, and Infective Cholangitis : Cholecystotomy.*

CASE 92.—Mrs. M., aged forty-six, seen with Dr. Townsend, Cork. Excessive vomiting for six weeks, and during past three weeks had subsisted on nutrient enemas; very ill; jaundice and infective cholangitis present.

*Operation.*—9/6/1894. Cholecystotomy; gall-bladder contracted and surrounded by firm adhesions; eighteen gall-stones removed from ducts, and gall-bladder drained without complete suture to parietes.

*After-History.*—Death from exhaustion due to continuation of vomiting on twelfth day after operation; no peritonitis.

*Gall-stones, Jaundice : Cholecystotomy ; Gastrolysis.*

CASE 93.—Mrs. P., aged forty-three, seen at infirmary. Spasms for ten months; jaundice present; patient emaciated and extremely weak.

*Operation.*—18/6/1894. Cholecystotomy; 160 gall-stones the size of peas removed from the gall-bladder and cystic duct. Drainage; adhesions to pylorus, etc., detached.

*After-History.*—Complete recovery.

*Gall-stones : Cholecystotomy.*

CASE 94.—Mrs. A., aged forty, seen at infirmary.

*Operation.*—19/7/1894. Cholecystotomy; 160 gall-stones removed.

*After-History.*—Good recovery.

*Gall-stones in Common Duct, Biliary Fistula : Cholelithotrixy.*

CASE 95.—Mr. R., aged thirty-seven, seen at infirmary. Admitted for biliary fistula following on cholecystotomy, performed at Wolverhampton some months before, when ten gall-stones were removed.

*Operation.*—10/8/1894. Cholecystotomy and cholelithotrixy; two stones crushed in the common duct.

*After-History.*—Cured.

*Gall-stones, Jaundice, Fistula of Duodenum, Abscess of Liver : Cholecystotomy.*

CASE 96.—Mr. V., aged sixty, seen with Dr. Carter, Ilkley. Jaundice present.

*Operation.*—18/8/1894. Cholecystotomy; thirty gall-stones removed from a cavity in the liver; fistulous ulceration into the duodenum closed.

*After-History.*—Recovery. Some months after, died from cancer of the liver.

*Catarrhal Cholecystitis : Cholecystotomy ; Gastrolysis.*

CASE 97.—Mrs. W., aged thirty-four, seen with Dr. Byers and Dr. Steen, Belfast.

*Operation.*—6/9/1894. Cholecystotomy, with separation of adhesions; gall-bladder filled with thick mucus and bile; chronic cholecystitis; extensive adhesions of gall-bladder to omentum and stomach; no gall-stones; drainage.

*After-History.*—Good recovery; well when heard of in 1896.

*Cancer of Liver, Jaundice : Exploratory Laparotomy.*

CASE 98.—Mrs. H., aged sixty, seen with Dr. Broughton, Dewsbury.

*Operation.*—12/9/1894. Laparotomy; cancerous nodules on liver; jaundice present; gall-bladder dilated.

*After-History.*—Recovered from the operation, but ultimately died some weeks after from the progress of the disease.

*Intestinal Obstruction from Gall-stone in Ileum : Enterotomy.*

CASE 99.—Mrs. L., aged forty-five, seen with Dr. Raimes and Dr. Anderson, York. Acute intestinal obstruction for five days.

*Operation.*—13/9/1894. Laparotomy; large gall-stone found in ileum, removed by incising intestine.

*After-History.*—Complete recovery; patient well, 1896.

*Gall-stones, Empyema of Gall-bladder : Cholecystotomy.*

CASE 100.—Mrs. T., aged thirty-six, seen with Dr. Tweedy, Northallerton.

*Operation.*—23/10/1894. Cholecystotomy; 8 ounces of milky fluid removed from the gall-bladder; three stones the size of nutmegs removed from the cystic duct; drainage for three days.

*After-History.*—Complete recovery, and gained nearly 1 stone in weight in a month; well 1896.

*Chronic Cholecystitis : Cholecystotomy.*

CASE 101.—Mrs. G., aged sixty, seen with Dr. Clifton, Sheffield. Spasmodic intermittent pain.

*Operation.*—10/11/1894. Cholecystotomy; gall-bladder filled with thick mucus and bile; chronic cholecystitis; drainage.

*After-History.*—Cured; quite well in 1896.

*Gall-stones ; Cholecystotomy.*

CASE 102.—Mr. C., aged forty-eight, seen at infirmary.

*Operation.*—2/12/1894. Cholecystotomy; gall-stones removed.

*After-History.*—Good recovery.

*Cancer of Pancreas, Jaundice : Cholecystotomy.*

CASE 103.—Mr. A., aged fifty, seen with Dr. Menzies, Edinburgh. Persistent jaundice.

*Operation.*—10/12/1894. Laparotomy; drainage of gall-bladder, with decided relief for a time; cancer of the pancreas.

*After-History.*—Recovered from the operation, and returned home at the month end, but died some months later.

*Gall-stones in Common Duct : Cholecystotomy ; Cholelithotrixy.*

CASE 104.—Mr. P., aged fifty-five, seen at the infirmary. History of attacks for eight years; jaundice at times.

*Operation.*—8/1/1895. Cholecystotomy and cholelithotrixy; eleven stones removed; several crushed in the common duct; drainage of gall-bladder.

*After-History.*—Recovery; fistula persisting. (See Case 121.)

*Gall-stones : Cholecystotomy.*

CASE 105.—Mr. J., aged fifty, seen at the infirmary. First attack twelve years ago; no tumour felt; had passed eight stones at various times.

*Operation.*—13/2/1895. Cholecystotomy ; five stones removed ; drainage.

*After-History.*—Cured.

*Gall-stones : Empyema of Gall-bladder ; Cholecystotomy.*

CASE 106.—Mr. C., aged fifty, seen with Dr. Husband, Ripon. Empyema of gall-bladder ; no jaundice present.

*Operation.*—8/3/1895. Cholecystotomy ; sixteen gall-stones removed from the gall-bladder and cystic duct ; 2 ounces of mucus in gall-bladder ; drainage, four days.

*After-History.*—Returned home well in three weeks ; well, 1897.

*Gall-stones : Cholecystotomy.*

CASE 107.—Mr. C., aged fifty-one, seen with Dr. Fairburn, Doncaster. Slight jaundice.

*Operation.*—14/3/1895. Cholecystotomy ; 720 gall-stones removed ; drainage.

*After-History.*—Cured.

*Gall-stones : Cholecystotomy.*

CASE 108.—Mr. D., aged forty-four, seen at the infirmary. History, two years with jaundice.

*Operation.*—20/3/1895. Cholecystotomy ; large stone removed from the cystic duct.

*After-History.*—Cured.

*Gall-stones : Cholecystotomy.*

CASE 109.—Mrs. C., aged thirty-seven, seen with Dr. de Legh, Redcar. Mucous fistula connected with gall-bladder.

*Operation.*—18/4/1895. Cholecystotomy ; gall-stones removed from the cystic duct.

*After-History.*—Good recovery ; well, 1900.

*Gall-stones : Cholecystotomy.*

CASE 110.—Mrs. P., aged fifty-five, seen at the infirmary.

*Operation.*—11/4/1895. Cholecystotomy ; one large gall-stone removed the size of a cherry.

*After-History.*—Cured ; well, 1896.

*Gall-stones : Cholecystectomy.*

CASE 111.—Mr. M., aged forty-six, seen with Dr. Keyes, New York, and Dr. MacGeagh, London. Frequent seizures of intense pain like cholelithiasis, which had doubtless been the cause of the cholecystitis and cholangitis.

*Operation.*—2/5/1895. Cholecystectomy ; gall-bladder cavity contracted ; walls hypertrophied and adherent.

*After-History.*—Good recovery, and nine months later was in perfect health.

*Gall-stones : Cholecystotomy.*

CASE 112.—Mrs. B., aged forty-one, seen at the infirmary. Attacks of pain with jaundice for eleven years.

*Operation.*—15/5/1895. Cholecystotomy ; forty-three stones removed, six the size of cherries.

*After-History.*—Cured.

*Gall-stones in Hepatic and Common Ducts : Cholecystotomy and Cholelithotripsy.*

CASE 113.—Mrs. G., aged forty-five, seen with Dr. Meade, Bradford.

*Operation.*—20/5/1895. Cholecystotomy and cholelithotripsy ; eight gall-stones removed from the cystic duct, several crushed in the common and hepatic ducts ; drainage.

*After-History.*—Completely cured ; well in 1897.

*Gall-stones : Cholecystotomy.*

CASE 114.—Mr. S., aged thirty-five, seen at the infirmary. Attacks of pain for ten years ; passed fourteen gall-stones.

*Operation.*—27/5/1895. Cholecystotomy ; 307 small and 5 large stones removed.

*After-History.*—Cured ; well, 1896.

*Spasmodic Pain resembling Gall-stone Attacks : Gastrolisis.*

CASE 115.—Mr. L., aged twenty-five, seen at infirmary. Attacks of spasms for some months.

*Operation.*—6/6/1895. Laparotomy and separation of adhesions ; adhesions around pylorus and gall-bladder.

*After-History.*—Cured.

*Biliary Fistula : Cholecystendysis.*

CASE 116.—Mrs. C., aged thirty-six, seen with Dr. Salter, Scarborough. Had biliary fistula following operation at another hospital, when eighteen stones were removed.

*Operation.*—3/7/1895. Cholecystotomy and cholecystendysis ; gall-bladder detached, the edges inverted and sutured.

*After-History.*—Cured.

*Gall-stones : Cholecystotomy ; Gastrolysis.*

CASE 117.—Mrs. D., aged forty-one, seen with Dr. Rowe, Leeds. Severe attack of pain seven months ago; numerous seizures since.

*Operation.*—4/7/1895. Cholecystotomy; one large stone removed; adhesions to pylorus, etc., detached.

*After-History.*—Cured.

*Chronic Pancreatitis : Cholecystenterostomy.*

CASE 118.—Mrs. C., aged fifty-one, seen with Dr. Clarke, Doncaster. Persistent jaundice; chronic pancreatitis.

*Operation.*—15/7/1895. Cholecystenterostomy (Murphy's button); several stones removed and crushed; tumour of pancreas felt. The sequel shows that the tumour was inflammatory.

*After-History.*—Recovered, but the Murphy's button was never found; well, 1898.

*Gall-stones and Cancer of the Liver and Gall-bladder : Cholecystotomy.*

CASE 119.—Mr. L., aged sixty-two, seen at the infirmary. Spasms and jaundice for twenty years.

*Operation.*—18/7/1895. Cholecystotomy; thirty-two gall-stones removed; drainage; cancer of the liver and gall-bladder.

*After-History.*—Recovered from the operation; relief from pain and from jaundice.

*Gall-stones : Cholecystotomy ; Cholelithotritry.*

CASE 120.—Mr. W., aged forty-two, seen with Dr. Sproule, Mirfield. Patient had never been jaundiced.

*Operation.*—23/7/1895. Cholecystotomy and cholelithotritry; one large stone in the cystic duct was crushed; drainage.

*After-History.*—Good recovery; well, 1897.

*Mucous Fistula following Cholecystotomy : Cholecystectomy and Choledochenterostomy.*

CASE 121.—Mr. P., aged fifty-five, seen at the infirmary. Operation undertaken for closing a mucous fistula.

*Operation.*—24/7/1895. Cholecystectomy and choledochenterostomy; the gall-bladder was found to be forming a tumour with walls  $\frac{1}{2}$  inch to  $\frac{3}{4}$  inch thick. Cholecystectomy was performed, and the open end of the cystic duct connected to the small bowel by means of a Murphy's button.

*After-History.*—Completely cured, and in good health, 1896.



*Cancer of Pancreas and Liver : Exploratory Operation.*

CASE 122.—Mr. G., aged forty, seen with Dr. Bronner, Bradford. Persistent jaundice.

*Operation.*—27/7/1895. Laparotomy; cancer of the liver and pancreas.

*After-History.*—Recovered from the operation; relief for some weeks.

*Chronic Pancreatitis, Jaundice : Cholecystenterostomy.*

CASE 123.—Mr. J. W. B., aged fifty-six, seen with Dr. Lee, Dewsbury. Pain and jaundice for a year.

*Operation.*—27/8/1895. Cholecystenterostomy; distended gall-bladder; no calculi; stenosis of the common duct from swelling of head of pancreas; 3 ounces of fluid tinged with blood removed from the gall-bladder; probably chronic pancreatitis.

*After-History.*—Good recovery; Murphy's button passed in two weeks. Report, 1897, to say that the patient had gained weight after the operation, and had been at work ever since, though he had had occasional attacks of pain and jaundice.

*Gall-stones : Cholecystotomy.*

CASE 124.—Mrs. J. O. F., aged thirty-five, seen with Mr. H. B. Hewetson. Ten years' history of spasms with intermittent jaundice.

*Operation.*—10/9/1895. Cholecystotomy; thirty stones removed; adhesions broken down.

*After-History.*—Cured; well, 1897.

*Gall-stones, Jaundice : Choledochotomy and Cholecystotomy.*

CASE 125.—Mr. W., aged fifty-two, seen at the infirmary. Slight jaundice.

*Operation.*—26/10/1895. Cholecystotomy and choledochotomy; gall-bladder ruptured suddenly during separation of adhesions; one stone removed,  $\frac{3}{4}$  inch in diameter, through an incision in the common duct; drainage through the loin.

*After-History.*—Cured; September, 1897, passed two gall-stones *per anum*; well in the interval and subsequently.

*Cancer of Pancreas : Laparotomy.*

CASE 126.—Mr. H., aged sixty, seen with Dr. Haynes, Low Moor. Jaundice and pain.

*Operation.*—18/11/1895. Laparotomy; cancer of pancreas.

*After-History.*—Decided relief for several months.

*Gall-stones, Cancer of Gall-bladder and Liver : Cholecystectomy ;  
Hepatectomy.*

CASE 127.—Mrs. W., aged fifty-four, seen with Dr. O'Connell, Keighley.

*Operation.*—23/11/1895. Cholecystectomy and hepatectomy; two gall-stones removed from the gall-bladder; gall-bladder distended and dilated with thick material like putty; walls infiltrated with malignant disease; cancer in the cystic duct; gall-bladder excised with  $\frac{1}{2}$  pound of liver.

*After-History.*—The patient improved and remained well till February 27, 1896, when she returned with a superficial nodule in the abdominal wall, which was excised. She died some months afterwards from a recurrence of the disease. Case reported at the Clinical Society, 1896.

*Gall-stones, Jaundice : Cholecystotomy.*

CASE 128.—Mr. M., aged forty-three, seen at the infirmary. Jaundice present.

*Operation.*—28/11/1895. Cholecystotomy; forty-eight stones removed; drainage.

*After-History.*—Cured.

*Gall-stones, Jaundice : Cholecystotomy.*

CASE 129.—J. M., female, aged thirty-two, seen at the infirmary. Attacks of pain with jaundice for eight years. After each attack passed four or five stones.

*Operation.*—3/12/1895. Cholecystotomy; gall-bladder, cystic and common ducts packed with stones—129 removed.

*After-History.*—Cured.

*Painful Spasms due to kinking of Bile-duct and of Pylorus, Dilatation of Stomach : Gastrolisis.*

CASE 130.—Mr. L., aged forty-six, seen with Dr. Lownds, Newcastle.

*Operation.*—9/12/1895. Laparotomy with separation of adhesions; adhesions around pylorus, gall-bladder, and liver, causing kinking and dilatation of stomach, probably due to gall-stones which had been passed before operation.

*After-History.*—Cured; well in 1897, and had gained a stone in weight.

*Painful Spasms, Duct Adhesions, Dilated Stomach : Separation of Adhesions and Pyloroplasty.*

CASE 131.—Mrs. W., aged twenty-nine, seen with Dr. Salter, Scarborough.

*Operation.*—14/12/1895. Laparotomy with separation of adhesions; adhesions around pylorus, gall-bladder, and liver, causing kinking and dilatation of the stomach, with stricture of the pylorus, probably due to gall-stones which had been passed before operation; pyloroplasty performed.

*After-History.*—Cured; well, 1899.

*Gall-stones, Tumour of Gall-bladder, Pregnancy: Cholecystotomy.*

CASE 132.—Mrs. W., aged thirty-seven, seen with Dr. James, Oulton. Gall-stone attacks associated with pregnancy (sixth month); patient very weak.

*Operation.*—17/12/1895. Cholecystotomy; gall-bladder contained  $8\frac{1}{2}$  ounces of fluid and seven large stones.

*After-History.*—Owing to a disturbance in the ward one night, a week after the operation, patient aborted, but made a complete recovery. (See Case 146.)

*Jaundice, Cancer of Common Duct: Exploratory Laparotomy.*

CASE 133.—Mrs. S., aged fifty, seen with Dr. Booth, Grimsby. Persistent jaundice; gall-stones.

*Operation.*—4/1/1896. Laparotomy; extensive malignant disease of cystic and common ducts.

*After-History.*—Recovered from the operation, and was relieved for a time, but died six or eight months afterwards.

*Gall-stones, Empyema of Gall-bladder: Cholecystotomy.*

CASE 134.—Mrs. B., aged thirty-six, seen with Dr. Taylor, Chester.

*Operation.*—12/1/1896. Cholecystotomy; three large gall-stones impacted in cystic duct; empyema of the gall-bladder; drainage.

*After-History.*—Cured; well, 1899.

*Cancer of Gall-bladder and Liver: Exploratory Operation.*

CASE 135.—Mr. D., aged fifty-two, seen at the infirmary.

*Operation.*—-/2/1896. Laparotomy; no stone found; drainage; malignant disease.

*After-History.*—Recovery from operation, and returned home.

*Gall-stones in Common Duct: Cholecystotomy; Cholelithotrixy.*

CASE 136.—Mrs. S., aged fifty-one, seen with Dr. Barrs. Slight jaundice; infective cholangitis.

*Operation.*—17/2/1896. Cholecystotomy and cholelithotrixy; forty gall-stones removed from gall-bladder and cystic duct, and two crushed in the common duct; wound healed twenty-seventh day.

*After-History.*—Cured; well, January, 1897.

*Gall-stones : Cholecystotomy.*

CASE 137.—Mrs. G., aged forty, seen with Dr. Burnie, Bradford.

*Operation.*—5/3/1896. Cholecystotomy; eight stones removed from the gall-bladder; ducts apparently clear.

*After-History.*—Recovery; several small stones passed through fistula, which was kept open for several weeks, but ultimately closed spontaneously; patient now well.

*Gall-stones : Cholecystotomy.*

CASE 138.—Mrs. H., aged fifty, seen at the infirmary.

*Operation.*—17/3/1896. Cholecystotomy; sixteen gall-stones removed, three as large as Brazil nuts.

*After-History.*—Cured.

*Adhesions around Gall-bladder and to Stomach : Gastrolysis, etc.*

CASE 139.—Mrs. F., aged forty-four, seen at the infirmary. Pains over gall-bladder region resembling cholelithiasis.

*Operation.*—23/6/1896. Exploratory; no gall-stones found; adhesions separated.

*After-History.*—Cured; in May the patient said she was better than for many months.

*Cancer of Gall-bladder and Stomach, Jaundice : Exploration.*

CASE 140.—Mr. P., aged fifty-three, seen at the infirmary. Jaundice present.

*Operation.*—26/3/1896. Laparotomy; malignant disease in the gall-bladder, secondary to pyloric cancer.

*After-History.*—Recovered from the operation, but was unrelieved.

*Gall-stones, Jaundice, Cholecystitis : Cholecystectomy.*

CASE 141.—Mrs. C., aged forty-seven, seen at the infirmary. Jaundice present.

*Operation.*—2/4/1896. Cholecystectomy; eighteen stones removed; adhesions very firm and gall-bladder shrunken; cystic duct ligatured, and the gall-bladder removed.

*After-History.*—Death; ligature slipped from the duct on the second day, and bile became extravasated, producing toxæmia and peritonitis. I was unfortunately absent at the time, or should have reopened the abdomen. A stone was found in the diverticulum of Vater.

*Cancer of Gall-bladder : Exploration.*

CASE 142.—Mr. R., aged sixty-two, seen with Dr. Gibson, Kirkby Stephen. Jaundice present; tumour in gall-bladder region.

*Operation.*—1/6/1896. Exploratory; malignant disease of liver and gall-bladder.

*After-History.*—Recovery from operation.

*Chronic Jaundice, Malignant Disease of Pancreas : Exploration.*

CASE 143.—Mrs. H., aged thirty-two, seen with Dr. Sharpe, Matlock. Persistent and deep jaundice, seventeen months; frequent and various hæmorrhages for several months.

*Operation.*—8/6/1896. Exploratory; tight stricture of the common duct; no gall-stones found; questionable malignant disease of pancreas.

*After-History.*—Death occurred from shock twenty-four hours after operation.

*Gall-stones : Cholecystotomy.*

CASE 144.—Mrs. R., aged thirty-seven, seen at the infirmary.

*Operation.*—23/6/1896. Cholecystotomy; thirty-nine gall-stones removed; drainage.

*After-History.*—Cured.

*Gall-stones, Jaundice : Choledochotomy ; Cholecystotomy.*

CASE 145.—Mrs. F., aged forty-four, seen at the infirmary. Deep jaundice present.

*Operation.*—25/6/1896. Numerous gall-stones removed from the gall-bladder; the common duct was blocked by a large stone, which was removed by incising the duct; gall-bladder distended and much thickened; drainage.

*After-History.*—Cured.

*Gall-stones, Jaundice : Cholecystenterostomy.*

CASE 146.—Mrs. W., aged thirty-seven, seen at the infirmary. This case was operated on during pregnancy, December 17, 1895, and returned on account of pain and jaundice.

*Operation.*—27/5/1896. Cholecystenterostomy; seven large stones removed, and gall-bladder fixed to intestine by a Murphy's button.

*After-History.*—Recovery; button never found; patient left the hospital well.

*Chronic Pancreatitis, Biliary Fistula : Cholecystenterostomy.*

CASE 147.—Mr. T., aged thirty-seven, seen with Dr. Sykes, Barnsley. Biliary fistula following operation at St. Bartholomew's Hospital; persistent jaundice, probably chronic pancreatitis.

*Operation.*—13/7/1896. Cholecystenterostomy (Murphy's button); no stones found; tumour of pancreas indefinitely felt through adhesions.

*After-History.*—Good recovery; bile all passing into the bowel, and wound healed.

*Gall-stones, Cancer of Liver : Exploratory Operation.*

CASE 148.—Mrs. S., seen with Dr. Empey, Steeton. Persistent jaundice.

*Operation.*—13/7/1896. Exploratory; gall-stones in shrunken gall-bladder and in common duct; extensive cancer of the liver; operation not proceeded with; hæmorrhage from wound afterwards, but controlled by calcium chloride.

*After-History.*—Recovered from the operation and lived four months.

*Cancer of Pancreas, Jaundice : Cholecystenterostomy.*

CASE 149.—Mr. S., aged forty-nine, seen at the infirmary. Jaundice continuous for four months.

*Operation.*—17/7/1896. Cholecystenterostomy; cancer of the pancreas and common duct; distended gall-bladder; no gall-stones found.

*After-History.*—Death; intraparietal and intraperitoneal hæmorrhage; no peritonitis; patient very exhausted at the time of operation, but lived a week after.

*Gall-stone in Common Duct : Choledochostomy : Drainage of Duct.*

CASE 150.—Mr. C., aged twenty-five, seen at the infirmary. Jaundice present.

*Operation.*—18/7/1896. Choledochostomy; large gall-stone, size of small hen's egg, in cystic and common duct crushed; cystic duct dilated and much longer than the gall-bladder; drainage of duct.

*After-History.*—Good recovery.

*Gall-stones, Empyema of Gall-bladder : Cholecystotomy.*

CASE 151.—Mrs. S., aged thirty-four, seen with Dr. Patterson, Dalton-in-Furness. Slight jaundice present.

*Operation.*—27/7/1896. Cholecystotomy; 2 ounces of thin pus in

the gall-bladder; two stones the size of cherries in the cystic duct; tense adhesion to duodenum separated.

*After-History.*—Complete recovery.

*Catarrhal Cholangitis, Jaundice, Hydatid Tumour : Hepatotomy ;  
Cholecystotomy.*

CASE 152.—Mr. G., aged fifty-four, seen with Dr. Sadler, Barnsley. Persistent jaundice for several months, and loss of 21 pounds in weight; chronic catarrh of gall-bladder and bile-ducts; large fluctuating tumour of liver reaching below the umbilicus.

*Operation.*—31/7/1896. Hepatotomy and cholecystotomy; hydatid cyst removed; drainage.

*After-History.*—Recovery; jaundice disappearing slowly within two months; quite well, January, 1897.

*Gall-stones, Jaundice, Suppurative Cholangitis : Cholecystotomy.*

CASE 153.—Mrs. E., aged thirty-eight, seen with Dr. Mackenzie, Bradford. Symptoms of gall-stones for years, acute for two months; jaundice and suppurative cholangitis present.

*Operation.*—20/8/1896. Cholecystotomy; two gall-stones removed; contracted gall-bladder, with numerous adhesions.

*After-History.*—Oozing from torn adhesions led to death from hæmorrhage, which was concealed at first; no vessel of any size could be found, but every point bled. Calcium chloride inadvertently omitted subsequent to operation.

*Gall-stones : Cholelithotrixy.*

CASE 154.—Mrs. H., aged thirty-eight, seen at the infirmary. Spasms for twelve years.

*Operation.*—27/8/1896. Cholelithotrixy; gall-bladder shrunken and adherent to surrounding structures; too small to bring to the surface; gall-stones found and crushed.

*After-History.*—Cured.

*Spasms, Jaundice, Adhesions binding down Bile-ducts separated :  
Cholecystotomy.*

CASE 155.—Mrs. T., aged fifty-six, seen at the infirmary. Spasms almost continuous for six months; jaundice and rigors; cholangitis.

*Operation.*—15/10/1896. Cholecystotomy; no gall-stones present; numerous adhesions around the ducts separated.

*After-History.*—Cured.

*Gall-stone in Common Duct, Jaundice and Infective Cholangitis :  
Cholecystenterostomy.*

CASE 156.—Mr. O., aged fifty-two, seen at the infirmary. Spasms for ten months; jaundice and infective cholangitis present.

*Operation.*—1/11/1896. Cholecystenterostomy; large stone too hard to crush, and patient too ill to bear a prolonged operation. Liver found nodular; Murphy's button used.

*After-History.*—Complete recovery, and jaundice had disappeared before he left the infirmary.

*Jaundice, Chronic Catarrhal Cholangitis, Hydatid Disease : Hepa-  
totomy and Cholecystotomy.*

CASE 157.—Mr. M., aged forty-four, seen at the infirmary. Jaundice and pain; attacks like gall-stone seizures.

*Operation.*—18/12/1896. Hepatotomy and cholecystotomy; chronic catarrh of the bile-ducts due to hydatid disease; hydatid cyst removed from the liver; drainage.

*After-History.*—Good recovery; jaundice gradually disappeared.

*Gall-stones in Common Duct : Choledochotomy ; Cholecystotomy.*

CASE 158.—Mrs. W., aged fifty, seen at the infirmary. Attacks of pain for some time; loss of weight; jaundice present.

*Operation.*—8/12/1896. Cholecystotomy and choledochotomy; common duct incised, two stones removed; duct sutured and gall-bladder drained.

*After-History.*—Cured.

*Empyema of Gall-bladder, Intervisceral Fistula : Drainage.*

CASE 159.—Mr. M., aged sixty-five, seen with Dr. Selkirk, Boston Spa. Violent pain; slightly distended gall-bladder; greatly dilated stomach. Rigors and fever accompanied the attacks of pain.

*Operation.*—17/12/1896. Exploration and drainage, with separation of adhesions. No gall-stones found; extensive adhesions; pyloric stenosis. The gall-bladder contained dark, thick, grunous, purulent material, and similar contents were found in the stomach, to which it was adherent.

*After-History.*—Death from shock thirty-six hours after operation. Unfortunately, the autopsy could not be made until forty-eight hours after death, when decomposition and post-mortem digestion had softened the tissues and prevented the exact nature of the disease being made out. The question of previous gall-bladder stomach fistula could not be determined.



*Pain and Obstruction : Gall-bladder, Stomach, and Colic Adhesions separated.*

CASE 160.—Mrs. C., aged forty-two, seen with Dr. H. J. Robson, Leeds. Spasmodic pain resembling gall-stones; partial intestinal obstruction.

*Operation.*—24/12/1896. Exploratory, with separation of adhesions of gall-bladder to stomach and colon; no gall-stones found.

*After-History.*—Recovery. February, 1899, reported to have had no pain since the operation.

*Jaundice and Infective Cholangitis, Hydatid Cyst discharging into Bile-ducts : Hepatotomy and Cholecystotomy.*

CASE 161.—Mr. M., aged forty-four, seen with Dr. Scatterty, Keighley. Hydatid disease, six years; simulating gall-stone attacks, one year; small cysts probably discharging into bile-ducts; infective cholangitis and jaundice present.

*Operation.*—28/1/1897. Hepatotomy and cholecystotomy.

*After-History.*—Good recovery.

*Gall-stones : Cholecystotomy.*

CASE 162.—Mrs. H., aged fifty-nine, seen with Dr. West, Morley. Spasmodic pain for years; jaundice in November; cholangitis with rigors.

*Operation.*—15/1/1897. Cholecystotomy; removal of ten large gall-stones from the gall-bladder; drainage.

*After-History.*—Recovery; the patient returned home in three weeks, and looked quite ten years younger than before the operation.

*Gall-stones in Common Duct, Jaundice : Cholecystotomy ; Stones worked back through Dilated Cystic Duct*

CASE 163.—Mr. B., aged thirty-five, seen with Dr. Raimes, York. Spasmodic pain for fifteen years; jaundice present on several occasions; intense pain for several weeks.

*Operation.*—24/1/1897. Cholecystotomy; fourteen gall-stones removed from the cystic and common ducts.

*After-History.*—Good recovery.

*Cancer of Liver and Gall-bladder : Exploratory.*

CASE 164.—Mrs. B., aged fifty, seen with Dr. Williams, Harrogate. Jaundice present.

*Operation.*—22/1/1897. Exploratory; cancer of the liver and gall-bladder.

*After-History.*—Recovered from the operation, but not materially relieved; survived for three months.

*Cholecystitis with Catarrh of Ducts : Cholecystotomy.*

CASE 165.—Mrs. S., aged thirty, seen at the infirmary. Gall-stone symptoms for two years; on two occasions patient was jaundiced, and gall-stones were found in the motions; numerous attacks of pain since the last gall-stone was found; slightly distended and inflamed gall-bladder.

*Operation.*—18/2/1897. Cholecystotomy; no gall-stone found; thickened mucus; chronic catarrh of the gall-bladder.

*After-History.*—Good recovery.

*Membranous Cholecystitis : Separation of Adhesions ; Cholecystotomy.*

CASE 166.—Mr. C., aged thirty-six, seen with Mr. Jonathan Hutchinson and Dr. Porter, Helmsley. Paroxysmal pain over the upper right abdomen for twenty years; rigid right rectus; no tumour; membranous casts found in the motions for some time before operation.

*Operation.*—18/2/1897. Laparotomy and separation of adhesions; no gall-stones found, but thick membranous mucus; cholecystotomy.

*After-History.*—Smooth recovery and no recurrence of gall-bladder pain, though three years afterwards had membranous enteritis again.

*Gall-stones : Cholecystotomy.*

CASE 167.—Mrs. G., aged thirty-five, seen with Dr. Grant, Elgin. Paroxysmal pains for twelve years, usually followed by jaundice, but no gall-stones found in the motions; rigid right rectus; no tumour.

*Operation.*—22/2/1897. Cholecystotomy; two gall-stones the size of cherries removed, one from the gall-bladder and one from the cystic duct.

*After-History.*—Good recovery; well, December, 1899.

*Chronic Pancreatitis, Jaundice : Cholecystenterostomy.*

CASE 168.—Mr. B., aged thirty-four, seen with Dr. Dowsing, Hull. Painful attacks resembling cholelithiasis since June, 1896; deep and continuous jaundice since December; distended gall-bladder.

*Operation.*—25/2/1897. Cholecystenterostomy; no gall-stones could be felt; numerous adhesions; swelling of pancreas; gall-bladder connected to the duodenum by a Murphy's button; calcium chloride administered before operation; chronic pancreatitis.

*After-History.*—Good recovery.

*Gall-stones : Cholecystotomy.*

CASE 169.—Mrs. W., aged forty, seen with Dr. Beesley, Darton. Painful indigestion for twenty years; some jaundice; severe cholelithic pains since June, 1896; usually jaundiced after the attacks.

*Operation.*—25/2/1897. Cholecystotomy; twenty gall-stones removed; empyema of the gall-bladder, with adhesions; calcium chloride administered before the operation.

*After-History.*—Complete recovery.

*Gall-stones, Empyema of Gall-bladder : Cholecystotomy.*

CASE 170.—Mrs. B., aged thirty-three, seen with Dr. Atkinson, Romalldkirk. Painful attacks since July, 1896, following on a fall; tumour in the gall-bladder region.

*Operation.*—25/2/1897. Cholecystotomy; twenty-six gall-stones removed from the gall-bladder and the cystic duct, with some muco-pus.

*After-History.*—Cured.

*Gall-stones in Common Duct : Choledochotomy.*

CASE 171.—Mrs. G., aged thirty-eight, seen with Dr. Friend, Leeds. Spasms for fifteen years; lately the attacks had been very frequent, and followed by rigors and increased jaundice; no tumour.

*Operation.*—15/3/1897.—Choledochotomy; fourteen stones removed from the gall-bladder and from the common duct.

*After-History.*—Good recovery; quite well, July, 1898.

*Cancer of Head of Pancreas and Common Duct : Cholecystotomy.*

CASE 172.—Mrs. S., aged sixty, seen with Dr. Nicholson, Gainsborough. Patient admitted to the infirmary with continuous pain in the right hypochondrium, associated with distended gall-bladder and some œdema of the legs; jaundice deep and continuous.

*Operation.*—18/3/1897. Cholecystotomy; cancer of head of the pancreas and common duct.

*After-History.*—Recovery.

*Gall-stones in Common Duct, Jaundice, and Infective Cholangitis : Cholecystenterostomy.*

CASE 173.—Mrs. W., aged fifty, seen with Dr. H. J. Robson, Leeds. Spasms for years, but for six months ague-like attacks and jaundice associated with the painful seizure; no tumour.

*Operation.*—6/4/1897. Cholecystenterostomy; adhesions so firm

that the common duct could not be cleared, though gall-stones could be felt in it; small gall-bladder connected to the duodenum by Murphy's button.

*After-History*.—Good recovery; in robust health, July 19, 1898.

*Gall-stones : Adhesions : Cholecystotomy ; Gastrolysis.*

CASE 174.—Mrs. A. G., aged thirty-three, seen with Dr. Hector, Drighlington. Attacks of paroxysmal pain, varying in intensity in right hypochondrium, since the age of eighteen. Since October last the attacks had been followed by jaundice, and occasionally by rigors and fever. Pain of late more on left side than right; she had lost weight; no tumour, but great tenderness felt over the region of the gall-bladder.

*Operation*.—10/4/1897. Cholecystotomy; six gall-stones and some inspissated bile removed; adhesions to pylorus separated.

*After-History*.—Complete recovery.

*Gall-stones, Tumour of Gall-bladder : Cholecystotomy.*

CASE 175.—Mrs. W., aged thirty-six, seen with Dr. Lee, Dewsbury. Spasms occasionally for years; two attacks of severe abdominal pain in December and February last, not accompanied by vomiting or followed by jaundice; great discomfort owing to the presence of a large tumour in the right hypochondrium.

*Operation*.—6/5/1897. Cholecystotomy; three large and twenty small gall-stones removed from the gall-bladder; one fair sized, one very large, and three small ones removed from the cystic duct.

*After-History*.—Complete recovery.

*Gall-stones, Phlegmonous Cholecystitis and Gangrene of Gall-bladder : Cholecystotomy, and Gauze Packing.*

CASE 176.—Mr. H., aged forty-seven, seen with Dr. Smith, Hyde Park, Leeds. Spasms for years; for six weeks severe pain with swelling below the right costal margin; jaundice first noticed a month ago; had had several ague-like seizures, and during the week before operation was acutely ill with manifest local peritonitis.

*Operation*.—19/5/1897. Cholecystotomy; gall-bladder dark in colour and full of grumous pus; one or two greenish gangrenous patches on it; nine gall-stones removed; adhesions of omentum not disturbed; free drainage and exclusion with iodoform gauze.

*After-History*.—Complete recovery; well, 1899.

*Gall-stone in Common Duct, Jaundice, and Infective Cholangitis :  
Choledochotomy.*

CASE 177.—Mrs. G., aged sixty-two, seen with Dr. Kershaw, Pudsey. For twenty years attacks of spasms, but no jaundice until four weeks before operation, since which time jaundice continuous, with ague-like attacks and rapid loss of flesh ; patient very feeble.

*Operation.*—21/5/1897. Choledochotomy ; one gall-stone the size of a cherry removed from the common duct through an incision, which was afterwards sutured ; drainage of the peritoneal pouch.

*After-History.*—Recovered from the operation, but never gained strength, and death occurred at the end of five weeks from exhaustion.

*Obstruction in Common Duct, Gall-stones with Cancer (?) Suppurative Cholangitis : Cholecystenterostomy.*

CASE 178.—Mrs. S., aged sixty-five, seen with Dr. Thompson, Skipton. Indefinite history of past pains ; influenza followed by deep jaundice twelve weeks before ; the pain did not precede the jaundice ; rapid loss of flesh and repeated rigors, with temperature  $104^{\circ}$  and  $105^{\circ}$  ; uniform enlargement of the liver ; petechiæ in the skin ; epistaxis. Diagnosis : suppurative cholangitis.

*Operation.*—25/5/1897. Patient too ill for prolonged operation ; cholecystenterostomy by Murphy's button ; thickening of common duct felt, with gall-stones (growth ?) ; pus and bile in ducts.

*After-History.*—Death from exhaustion and shock the third day.

*Gall-stones in Common Duct : Cholecystotomy and Cholelithotrixy.*

CASE 179.—Mrs. N., aged fifty-nine, seen with Dr. Panton, Bolton. Gall-stones. First attack fourteen years ago ; three or four attacks the following year, then an interval of six years. For last six weeks patient had never been free ; sometimes two to four attacks daily. Rigors, vomiting, and jaundice had characterized each attack ; tumour present.

*Operation.*—27/5/1897. Cholecystotomy ; removal of gall-stones from the gall-bladder, cystic, hepatic, and common ducts ; cholelithotrixy performed on those stones which could not be removed through the gall-bladder incision. Subsequent injections of olive oil were employed to dissolve any fragments remaining in the common duct.

*After-History.*—Good recovery.

*Gall-stones in Common Duct : Cholecystotomy, etc.*

CASE 180.—Mrs. C., aged fifty-eight, seen with Dr. Ramsay, York. Gall-stone attacks without jaundice for several years ;

attacks very frequent of late, and slight jaundice following seizures; chill and fever after some of the attacks.

*Operation.*—12/6/1897. Cholecystotomy; seventy gall-stones removed from gall-bladder and the cystic duct, and some passed back from the common duct into the gall-bladder, and then removed; drainage.

*After-History.*—Complete and permanent recovery.

*Gall-stones : Cholecystotomy.*

CASE 181.—Mrs. R., aged thirty-eight, seen with Dr. Empey, Cross Hills. First attack of abdominal pain fourteen years ago, recurring at intervals of three months to one year. For five days following and including Good Friday the patient had had one attack daily; then another at Whitsuntide; none since. The attacks were accompanied by rigors and vomiting, and followed by jaundice; patient passed four small stones *per anum* after the last attack.

*Operation.*—17/6/1897. Cholecystotomy; many stones removed, one as large as a pigeon's egg.

*After-History.*—Complete recovery.

*Gall-stones in Ampulla of Vater : Duodeno-Choledochotomy.*

CASE 182.—Mrs. B., aged thirty-nine, seen at the infirmary. First attack of pain in February, with jaundice, clay-coloured motions, and dark-coloured urine, also vomiting and constipation; confined to bed five weeks; second attack one month ago, similar to the first; no tumour to be felt.

*Operation.*—17/6/1897. Duodeno-choledochotomy; gall-bladder found to be much atrophied; no stones in either gall-bladder or ducts, but two small, hard stones felt and removed from the ampulla of Vater through an incision in the duodenum, which was then sutured; no drainage.

*After-History.*—Complete recovery; well when seen six months after.

*Gall-stones, Jaundice, Cancer of Common and Cystic Duct :  
Cholecystotomy.*

CASE 183.—Mrs. G., aged fifty-three, seen with Dr. Clarke, Morley. Spasms for eighteen years; for a year severe pain, failure of health, and loss of weight; jaundice and ague-like attacks for a month; no tumour.

*Operation.*—28/6/1897. A number of gall-stones removed, but cancer of the junction of the cystic and common ducts, with a cancerous nodule in the liver, found; drainage of the gall-bladder.

*After-History.*—Recovery; decided relief for a time, and patient returned home within the month.

*Jaundice, Cirrhosis of Liver, Hamorrhagic Diathesis : Laparotomy.*

CASE 184.—Mrs. H., aged fifty-four, seen with Dr. Ellis, Halifax. Patient had suffered from spasms since the age of seventeen; they had lately increased in number and severity, and were accompanied by vomiting and followed by jaundice.

*Operation.*—15/7/1897. Exploratory; liver found nodular and much contracted (cirrhosis); gall-bladder contracted over several stones, but the ducts were free; wound closed without further interference as the bleeding was very free, and the patient was bearing the operation very badly.

*After-History.*—Decided relief; wound healed by first intention, and the patient returned home in the third week.

*Gall-stones, Cancer of Stomach : Cholecystotomy.*

CASE 185.—Mrs. M., aged fifty, seen at the infirmary. Attacks of abdominal pain since the age of fifteen; first attack due to gall-stones last August, when patient was confined to bed for twelve weeks; she had had rigors, vomiting, and jaundice; second attack in February; in bed five weeks; urine high-coloured, motions pale. On examination great tenderness could be felt.

*Operation.*—16/7/1897. Cholecystotomy; gall-bladder found full of stones—seventy-six removed; very extensive adhesions in all directions were found; there was a malignant growth involving the pylorus.

*After-History.*—Good recovery from the operation, and marked relief to symptoms.

*Gall-stones, Cholecystitis : Cholecystotomy.*

CASE 186.—Mrs. P., aged thirty-eight, seen with Dr. Panton, Bolton. Biliary colic at irregular intervals for nine years; jaundice had followed recent attacks, and during the month previous to operation there had been attacks of fever with the seizures, the temperature reaching 104°; loss of weight 16 pounds in the month; enlarged right lobe of the liver felt, with tenderness over the gall-bladder.

*Operation.*—21/7/1897. Cholecystotomy; small gall-bladder containing muco-pus and two gall-stones, which were removed; drainage; adhesions extensive.

*After-History.*—Good recovery; quite well in 1898.

*Gall-stones in Common Duct : Choledochotomy and Cholecystotomy.*

CASE 187.—Mrs. A., aged forty-two, seen at the infirmary. Gall-stones; first attack of pain six years ago; frequent attacks since, increasing in severity, with rigors, vomiting, and jaundice; urine dark-coloured and fæces very light; no tumour.

*Operation.*—28/7/1897. Choledochotomy; one large and several small stones removed from the gall-bladder and common duct.

*After-History.*—Good recovery.

*Gall-stones in Common Duct : Choledochotomy.*

CASE 188.—Mrs. R., aged fifty-one, seen with Dr. Jones, Hucknall Torkard. Subject to attacks of pain over the liver for years up to three years ago, since which time to Christmas, 1897, had been free from pain; from Christmas numerous attacks, usually followed by jaundice and ague-like seizures; great loss of flesh; presystolic cardiac bruit.

*Operation.*—5/8/1897. Choledochotomy; large gall-stone removed through an incision in the common duct, which was then closed by sutures.

*After-History.*—Good recovery; quite well when heard of some months later; in good health, 1900.

*Gall-stones : Cholecystotomy.*

CASE 189.—Mrs. H., aged fifty-four, seen with Dr. Alcock, Goole, and Dr. Churton, Leeds. Subject to gall-stone attacks, at times followed by jaundice, for four years; loss of flesh; pain often on left side; enlarged right lobe of the liver, with enlargement of the gall-bladder; spleen felt well below the left costal margin, but blood normal.

*Operation.*—30/8/1897. Cholecystotomy; numerous gall-stones removed from the gall-bladder and cystic duct; drainage of the gall-bladder.

*After-History.*—Good recovery from the operation, and returned home within the month; no recurrence of gall-stones; the following year developed phthisis after pneumonia.

*Gall-stones, Infective Cholangitis, Empyema of Gall-bladder :  
Cholecystotomy.*

CASE 190.—Mr. S., aged forty, seen with Dr. Sprent, Slingsby. Acute suppurative cholangitis. First attack of pain four years ago, repeated frequently since at varying intervals, ranging from one to twelve months. Lately they had been very frequent, sometimes three attacks a week. Patient had rigors, dark-coloured urine, light motions, and jaundice. Enlarged gall-bladder easily felt through abdominal parietes.

*Operation.*—2/9/1897. Cholecystotomy; 1 ounce of pus removed from the gall-bladder; also two large gall-stones removed from the cystic duct, which was ulcerated.

*After-History.*—Complete recovery of health, but at times had a discharge from the scar where the drainage-tube had been.



*Gall-stones : Cholecystotomy.*

CASE 191.—Mrs. T., aged thirty-five, seen at the infirmary. Gall-stones; recurring attacks of paroxysmal pain in right hypochondrium, with vomiting and slight rigors; no jaundice during paroxysms, but for a few hours after, a tumour could be distinctly felt, and then disappeared.

*Operation.*—23/9/1897. Cholecystotomy; two gall-stones removed.

*After-History.*—Complete recovery.

*Catarrhal Cholecystitis : Cholecystotomy.*

CASE 192.—Mr. B., aged forty-six, seen with Dr. John Clarke, Morley. Patient had had recurrent attacks of pain, resembling in every way the attacks due to gall-stones, and also followed by jaundice.

*Operation.*—23/9/1897. Cholecystotomy; no gall-stones found, but thickened mucus in the gall-bladder; chronic catarrh; drainage of the gall-bladder for a fortnight.

*After-History.*—Complete and permanent recovery.

*Gall-stones, Hydrops of Gall-bladder : Cholecystotomy.*

CASE 193.—Mrs. G., aged fifty, seen with Dr. Woods, Batley. Spasms for years; swelling on right of abdomen noticed for four years; no jaundice; tumour of gall-bladder could be distinctly felt.

*Operation.*—28/9/1897. Cholecystotomy; twenty-two gall-stones removed from the gall-bladder and cystic duct, and half a pint of mucus from the gall-bladder.

*After-History.*—Good recovery; quite well some months later.

*Gall-stone, Empyema of Gall-bladder, Phlegmonous Cholecystitis : Choledochotomy ; Cholecystotomy.*

CASE 194.—Mrs. B., aged thirty, seen with Dr. Greenwood, Ossett. Gall-stones; attacks of paroxysmal pain in gall-bladder region for five years; the first attack was accompanied by rigors, vomiting, and nausea, and followed by jaundice; it lasted six weeks. Since January 1, 1893, patient had always been jaundiced and unable to work, and had had amenorrhœa extending over long periods; lately metrorrhagia; no tumour could be felt.

*Operation.*—7/10/1897. Choledochotomy; one stone, weighing 1 drachm, removed from common duct; offensive pus drained from the gall-bladder, which was dark coloured and covered with lymph.

*After-History.*—Good recovery.

*Chronic Pancreatitis, Gall-stones, Contracted Bile-duct, Jaundice : Cholecystenterostomy ; Gastrolysis.*

CASE 195.—Mrs. R., aged forty-nine, seen with Dr. Kilner Clarke, Huddersfield. Patient had had two gall-stones removed from the

gall-bladder in Canada three years ago, but the ducts could not be cleared on account of collapsed condition ; never free from jaundice since operation ; frequent vomiting ; dilatation of stomach ; tenderness over the gall-bladder and pylorus.

*Operation.*—18/10/1897. Cholecystenterostomy ; adhesions of gall-bladder, bowel, and pylorus very firm, but freely detached thickening along the bile-ducts, evidently obstructing flow of bile ; gall-bladder united to duodenum by metal button. Pancreas swollen.

*After-History.*—Slow but satisfactory recovery ; health gradually regained.

*Gall-stones in Gall-bladder and Common Duct : Cholecystotomy ;  
Cholelithotripsy.*

CASE 196.—Mrs. B., aged fifty-one, seen with Dr. Moffatt, Keighley. Gall-stones ; first attack four years ago, very severe ; relieved after several hours by hypodermic injections of morphia ; it was accompanied by rigors and vomiting, but no jaundice followed ; frequent attacks since, followed by slight jaundice ; no tumour could be felt.

*Operation.*—19/10/1897. Cholecystotomy ; removal of several gall-stones from the gall-bladder and cystic duct, and others crushed in common duct.

*After-History.*—Good recovery.

*Gall-stones : Cholecystotomy.*

CASE 197.—Mrs. W., aged forty-two, seen at the infirmary. Gall-stones ; recurring attacks of pain in right hypochondrium, three years, accompanied by severe vomiting, retching, and rigors ; no jaundice ; tumour present.

*Operation.*—20/10/1897. Cholecystotomy.

*After-History.*—Good recovery.

*Catarrhal Cholecystitis, Adhesions : Cholecystotomy and Gastrolysis.*

CASE 198.—Mr. C., aged thirty-three, seen with Dr. Squance, Sunderland. Subject to attacks of gall-stone colic from 1880 ; severe attack in 1886, followed by jaundice for a fortnight ; lately the attacks had recurred every week, but without jaundice ; some tenderness over gall-bladder.

*Operation.*—8/11/1897. Cholecystotomy ; chronic catarrh of the gall-bladder ; no gall-stones found ; drainage of the gall-bladder and detaching of adhesions to pylorus, etc.

*After-History.*—Complete recovery ; there had been no recurrence of pain six months later ; well, 1902.

*Typhoidal Cholecystitis, Intestinal Obstruction by Band : Division of Band.*

CASE 199.—Mrs. S., aged thirty-six, seen with Dr. Crawford, Ingrow. Typhoidal cholecystitis in March and April, 1897; intestinal obstruction, November, 1897.

*Operation.*—18/11/1897. Laparotomy; division of band stretching from liver to colon and omentum, and compressing hepatic flexure of colon.

*After-History.*—Complete recovery.

*Gall-stone, Empyema of Gall-bladder : Cholecystotomy.*

CASE 200.—Mrs. W., aged thirty-six, seen with Dr. Barrs and Dr. Rumboll, Leeds. Pain on right of abdomen, with tumour simulating movable kidney; never had spasms.

*Operation.*—25/11/1897. Cholecystotomy; 10 ounces of pus removed from the gall-bladder, and a gall-stone the size of a cherry removed from the cystic duct; drainage.

*After-History.*—Returned home within a month with wound healed. Health regained. Three years later had retention of mucus in gall-bladder requiring drainage.

*Gall-stones, Cancer of Liver and Gall-bladder : Cholecystectomy and Hepatectomy.*

CASE 201.—Mrs. H., aged fifty-two, seen with Dr. Ruxton, Blackpool. Pain over the gall-bladder for a year; tumour noticed for a month.

*Operation.*—27/11/1897. Cholecystectomy and hepatectomy; cancer of the gall-bladder and adjoining part of the liver, with gall-stones in the gall-bladder and cystic duct. All affected parts removed by means of an elastic ligature.

*After-History.*—Good recovery; patient out of doors in six weeks; recurrence of disease in April, 1898.

*Chronic Catarrhal Cholecystitis : Cholecystotomy.*

CASE 202.—Mrs. F., aged forty-six, seen with Dr. Smyth, Keighley. Gall-stones; patient operated on in March, 1896, in a neighbouring hospital, but is said to have derived little benefit. The operation was only exploratory for symptoms pointing to renal calculus, but nothing was discovered. Was an in-patient in March, 1897, and transferred to Dr. Churton. Slight improvement under medical treatment. Since May the attacks had grown in severity and frequency. No jaundice.

*Operation.*—17/12/1897. Ropy mucus removed from the gall-bladder, which was seat of chronic catarrh; no stones were found; drainage.

*After-History.*—Good recovery and marked relief to symptoms

*Gall-stones, Empyema of Gall-bladder : Cholecystotomy.*

CASE 203.—Mrs. B., aged forty, seen with Dr. Atkinson. Gall-stones. Patient had suffered for nine years from typical attacks, due to presence of stones in the gall-bladder; attacks followed by jaundice, and by constipation alternating with diarrhoea. For the last twelve months she had been confined to bed. Tumour easily defined.

*Operation.*—23/12/1897. Cholecystotomy; fifty-six gall-stones removed from the gall-bladder, and about half a pint of muco-pus; drainage.

*After-History.*—Good recovery.

*Catarrh of Gall-bladder, with Retention of Ropy Mucus : Cholecystenterostomy.*

CASE 204.—Mrs. S., aged twenty-seven, seen with Dr. Patterson, Dalton-in-Furness. Recurrence of pain exactly resembling gall-stone attacks, but without jaundice; confined about a month ago, but attacks no better since delivery, and larger doses of morphia required.

*Operation.*—7/1/1898. Cholecystenterostomy; adhesions detached and gall-bladder and ducts explored; no gall-stones found, but thickened ropy mucus in gall-bladder; gall-bladder connected to duodenum by metal button.

*After-History.*—Good recovery, and returned home within a month; some pain a few weeks after return; quite well at the beginning of 1899.

*Catarrh of Gall-bladder, Adhesions to Pylorus : Cholecystotomy ; Gastrolysis.*

CASE 205.—Mr. W., aged twenty-three, seen with Dr. Snell, Gargrave. In May, 1890, patient was in the infirmary, when adhesions of the pylorus to the gall-bladder were broken down. He was readmitted in 1892 in consequence of a return of previous pain, and taught to wash out his stomach, which afforded him relief. For past twelve months pain had increased in severity, and was localized to the old wound. There had been no jaundice; he had lost weight rapidly during the last three weeks.

*Operation.*—7/1/1898. Cholecystotomy for chronic catarrh; firm adhesions were found between the pylorus and under-surface of gall-bladder; the adhesions were broken down and omentum interposed.

*After-History.*—Complete recovery and loss of all pain; June, 1899, the patient was quite well and had regained flesh; later, had some stomach symptoms.

*Gall-stones, Empyema of Gall-bladder : Cholecystotomy.*

CASE 206.—Mrs. D., aged fifty-one, seen at the infirmary. Gall-stones; recurring attacks of pain since the age of eighteen years, accompanied by rigors, but no jaundice. Tumour observable by patient since August, 1897.

*Operation.*—20/1/1898. Cholecystotomy; gall-bladder aspirated and  $\frac{1}{2}$  ounce of pus drawn off; 209 gall-stones removed from the gall-bladder and ducts; drainage.

*After-History.*—Good recovery; well when last heard of.

*Gall-stones : Cholecystotomy ; Vertical Displacement of Liver.*

CASE 207.—Mrs. W., aged forty-four, seen with Dr. Allott, Barnsley. Gall-stones. For five years the patient had suffered from recurring attacks of paroxysmal pain in the region of the gall-bladder, lasting several hours and confining her to bed for some time afterwards. The pain was accompanied and followed by all the usual symptoms on each occasion; no tumour present.

*Operation.*—27/1/1898. Cholecystotomy; a stone the size of a cherry found in the cystic duct, crushed by the fingers and extracted through the cholecystotomy opening; gall-bladder contracted and surrounded by adhesions; right lobe of liver abnormal in shape and position; vertical displacement of liver.

*After-History.*—Good recovery, and well when last seen.

*Gall-stones, Cancer of Gall-bladder and Liver : Cholecystectomy and Hepatectomy.*

CASE 208.—Mrs. B., aged fifty-two, seen with Dr. Carter, Richmond. Attacks of pain in right hypochondrium commenced in September, 1897, but became especially severe in December; a large tumour present.

*Operation.*—17/2/1898. Cholecystectomy and hepatectomy; gall-bladder and cystic duct filled with stones; walls of gall-bladder infiltrated with growth, which extended into the liver, pylorus, and colon; adhesions detached; gall-bladder and adjoining part of liver removed by elastic tourniquet; tumour of colon removed at same time.

*After-History.*—Death from shock.

*Gall-stone in Common Duct, Jaundice, and Infective Cholangitis : Duodeno-Choledochotomy.*

CASE 209.—Mrs. H., aged fifty-seven, seen with Dr. Parke, Tidswell. Gall-stones; first attack twelve months ago, lasting for several hours, followed by jaundice. It commenced with

a rigor; the urine was very dark-coloured and the motions pale; the attacks had recurred since at very short intervals; she had lost considerably in weight; infective cholangitis.

*Operation.*—3/3/1898. Duodeno-choledochotomy; very extensive adhesions were met with and broken down; gall-bladder not to be found; a large stone was found in the ampulla of Vater, and removed through an incision in the duodenum; duodenum sutured; no drainage.

*After-History.*—Good recovery; report later to say the patient was quite well.

*Gall-stones : Cholecystotomy.*

CASE 210.—Miss H., aged fifty, seen with Dr. Haydon, Marlborough, Wilts. Attacks of pain over the gall-bladder off and on for seventeen years; frequent since Christmas, 1897; no jaundice.

*Operation.*—11/3/1898. Cholecystotomy; eight gall-stones removed from the gall-bladder and cystic duct; drainage of the gall-bladder.

*After-History.*—Good recovery; quite well when last heard of.

*Gall-stones, Adhesion to Pylorus : Cholecystotomy ; Gastrololysis.*

CASE 211.—Mr. H., aged forty-five, seen with Dr. Hyne, Cornwall, and Dr. Barrs, Leeds. Hepatic colic and dyspepsia for ten years; of late the attacks had been frequent; loss of flesh; no jaundice present.

*Operation.*—12/3/1898. Cholecystotomy; 350 gall-stones removed from the gall-bladder and cystic duct: adhesions to pylorus and gut separated.

*After-History.*—Good recovery; quite well, June, 1903.

*Gall-stones, Acute Cholecystitis with Peri-Cholecystitis and Abscess : Cholecystotomy.*

CASE 212.—Mr. F., aged forty-eight, seen with Dr. Hick, Leeds. Painful epigastric attacks for years, followed by vomiting, but without jaundice; acute symptoms about a week; increasing swelling under right ribs; acute cholecystitis, with abscess and gall-stones.

*Operation.*—19/3/1898. Cholecystotomy; gall-bladder had ruptured, and there was an abscess outside it limited by adhesions; twelve gall-stones removed; drainage of the gall-bladder.

*After-History.*—Good recovery; perfectly well when seen four months later.

*Chronic Pancreatitis : Cholecystotomy.*

CASE 213.—Mr. D., aged forty-five, seen with Dr. Robertson, Pickering. Painful epigastric attacks twelve months, with vomiting, but no jaundice; deep jaundice since January 1, with ague-like attacks; loss of  $2\frac{1}{2}$  stones in weight.

*Operation.*—29/3/1898. Cholecystotomy; drainage of distended gall-bladder; thickened duct felt and swelling of pancreas, thought to be cancer of head of pancreas and common bile-duct; drainage of gall-bladder for ten days.

*After-History.*—Complete recovery; quite well, August 16, 1898—had gained 1 stone in weight; in good health, 1901. Case, chronic pancreatitis.

*Gall-stones in Gall-bladder and Common Duct, Jaundice, and Infective Cholangitis : Cholecystotomy and Cholelithotrixy.*

CASE 214.—Mrs. N., aged fifty-nine, seen with Dr. Erskine Stuart, Batley. Gall-stones; first attack fourteen years ago; pain paroxysmal in character, and at first was short in duration, recurring about every two months, but for a short time previous to admission came on every fourteen days, was much more severe, and lasted for a longer time. Patient had vomited, and had had severe rigors, and each attack was followed by jaundice. No tumour to be felt.

*Operation.*—31/3/1898. Cholecystotomy; gall-bladder aspirated previous to opening; 565 gall-stones removed, several crushed in ducts; firm adhesions around the gall-bladder.

*After-History.*—Good recovery.

*Gall-stones in Common Duct : Choledochotomy.*

CASE 215.—Mrs. S., aged forty-seven, seen with Dr. Saunders, Wales. Patient first admitted in February, when she refused operation. The history was that eighteen months previous to admission she had a severe attack of abdominal pain in the right hypochondrium, which radiated to the back and the left shoulder-blade. The attacks had recurred frequently since, and had increased in severity and duration. Membranous casts noticed in the motions; a tumour, the size of an egg, felt on palpation.

*Operation.*—7/4/1898. Choledochotomy; seventy-eight stones removed from the gall-bladder, cystic and common ducts; numerous adhesions detached.

*After-History.*—Recovery; left the infirmary well within the month with the wound healed; subsequently a fistula formed.

*Catarrhal Cholecystitis : Cholecystotomy.*

CASE 216.—E. G., female, aged thirty-two, seen with Dr. Davidson, Drighlington. First attack, September, 1897, on leaving her bed after an attack of rheumatic fever. The attacks had recurred frequently since, and had increased in violence; they were always followed by jaundice. No tumour could be made out.

*Operation.*—7/4/1898. Gall-bladder aspirated, and on incision found full of thick, bile-stained fluid containing soft, sago-like bodies; no stones found; drainage.

*After-History.*—Good recovery; no recurrence of pain.

*Gall-stones in Hepatic and Common Ducts : Choledochotomy; Gastrolysis.*

CASE 217.—Mrs. J., aged forty-nine, seen with Dr. Irving, Huddersfield. Seven years ago frequent attacks of spasms for a year, after which no recurrence for six years. January, 1898, recurrence of pain followed by jaundice and ague-like seizures; stomach dilated and liver enlarged.

*Operation.*—16/5/1898. Choledochotomy; adhesions of gall-bladder to pylorus separated; gall-bladder drained; common duct incised and several gall-stones removed; finger inserted into duct, and other stones felt in hepatic duct and removed by small scoop.

*After-History.*—Complete recovery and regained health.

*Gall-stone in Common Duct : Duodeno-choledochotomy.*

CASE 218.—Mr. G., aged thirty-nine, seen with Dr. Peach Hay, Peterborough. Gall-stones; first attack six and a half years ago; pain more or less continuous since, and occasionally severe paroxysmal attacks lasting twelve to thirteen hours; the attacks were accompanied by vomiting and rigors, and followed by jaundice and high-coloured urine; he had lost 2 stones in weight since the attacks first began; no tumour to be made out.

*Operation.*—17/5/1898. Duodeno-choledochotomy; gall-bladder atrophied and could not be found; large gall-stone found impacted in the third part of common duct; duodenum incised; stone size of filbert extracted; duodenum sutured; no drainage.

*After-History.*—Good recovery; letter, dated July 24, 1899, to say that the patient was well and had returned to his work as goods guard on the railway.

*Gall-stones, Gall-bladder-Stomach Fistula : Repair of Fistula; Cholecystotomy.*

CASE 219.—Mrs. H., aged sixty, seen with Dr. Clarke, Doncaster. Attacks of gall-stone pains for fifteen months, lately very frequent and followed by slight jaundice; loss of weight.



*Operation.*—7/7/1898. Cholecystotomy and detaching of adhesions; sinus between gall-bladder and stomach excised, and stomach wall repaired; gall-stones removed.

*After-History.*—Good recovery; in September attack of pain, probably catarrhal, as it soon passed off; regained weight formerly lost; now well, 1902.

*Gall-stones : Choledochotomy.*

CASE 220.—Mr. D., aged forty-six, seen with Dr. Smith, Doncaster. Attacks of epigastric pain two years with vomiting, but without jaundice; loss of a stone in weight; tumour present for at least six weeks; slight jaundice.

*Operation.*—7/7/1898. Choledochotomy; gall-stones removed from gall-bladder by cholecystotomy; one impacted deeply in cystic, near the common, duct, removed by incising the duct, which was afterwards sutured.

*After-History.*—Good recovery; now quite well.

*Gall-stone causing Perceptible Tumour : Cholecystotomy.*

CASE 221.—Miss J. T., aged thirty, seen at the infirmary. Four years' history of fairly constant pain in the right hypochondrium of a dull, aching character, considerably worse on exertion, and on several occasions it radiated into the right subscapular region. During the attacks she vomited, but never had a rigor and was never jaundiced. On abdominal examination, a hard, globular, tender mass was felt below the right costal margin, which was freely movable from side to side, and moved with respiration.

*Operation.*—7/7/1898. Cholecystotomy; large oval stone weighing 1 ounce 30 grains, and measuring  $2\frac{1}{4}$  by  $1\frac{3}{8}$  inches, removed from the gall-bladder; gall-bladder drained for four days.

*After-History.*—Complete recovery, and well when last seen.

*Gall-stones in Common Duct : Cholecystotomy.*

CASE 222.—Mrs. P., aged fifty-three, seen with Dr. Robinson, Poole. No pain before four months ago; several attacks since; two months ago pain followed by jaundice; recurring pains followed by deepened jaundice and ague-like attacks; great loss of flesh.

*Operation.*—12/7/1898. Cholecystotomy; two large gall-stones the size of walnuts removed from the common duct through the dilated cystic duct and gall-bladder; twelve other smaller concretions removed from the gall-bladder and cystic duct; pus in the gall-bladder.

*After-History.*—Good recovery; within five weeks gained 10 pounds in weight; well, June, 1899—had gained 2 stones in weight and looked in robust health.

*Gall-stones in Common Duct : Choledochotomy ; Gastrolysis.*

CASE 223.—Mrs. P. W., aged thirty-four, seen with Dr. Craik, Conisborough. Four years' history of attacks of pain commencing in the epigastrium and radiating to the mid-scapular region; each attack lasted several hours, was accompanied by a rigor and vomiting, and followed by jaundice; during the last eight months the attacks had been more severe and frequent, the jaundice persisting; the patient was deeply jaundiced; no distension of gall-bladder; tenderness on deep pressure below the right costal margin.

*Operation.*—21/7/1898. Choledochotomy; extensive adhesions between gall-bladder, stomach, duodenum, and omentum separated; gall-bladder contracted; common duct blocked with stones; stones extracted with scoop through incision in the common duct; duct closed with a double row of sutures; gauze drainage; recovery delayed by an attack of bronchitis, to which patient was subject; jaundice had almost completely disappeared when she left the hospital.

*After-History.*—Very well, September, 1899.

*Gall-stones : Cholecystotomy.*

CASE 224.—Mrs. A., aged thirty-eight, seen at the infirmary. Twenty years' history of pain starting in the right hypochondrium and radiating to the right scapular region, generally accompanied by vomiting, but only once by jaundice in one of the first attacks; pain much more severe lately; tenderness on pressure over the gall-bladder; no tumour felt.

*Operation.*—5/8/1898. Cholecystotomy; forty-five gall-stones removed; ducts clear; gall-bladder drained for six days.

*After-History.*—Patient did well for three weeks, and then left the hospital against advice.

*Gall-stone : Cholecystotomy.*

CASE 225.—Mrs. S., aged fifty, seen at the infirmary. Patient suffered from spasms when a girl, but was free from trouble up to four years ago; since then she had had frequent attacks of pain, which had become more severe during the last six months. Pain commenced in the right hypochondrium, and radiated to the right subscapular region. She had been jaundiced after two attacks, and then gall-stones had been found in the motions.

*Operation.*—10/8/1898. Cholecystotomy; one rounded stone, weighing 30 grammes, removed from the gall-bladder; ducts free.

*After-History.*—Good recovery; well when last heard of.

*Gall-stones in Common Duct : Cysto-dochenterostomy ; Gastrolysis.*

CASE 226.—Mrs. P., aged forty-four, seen at the infirmary. First attack of pain five years ago; another three years ago; free from pain up to eight months ago; since then attacks every few weeks; pain very severe, radiating from the right hypochondrium to the right subscapular region, accompanied by vomiting and always followed by jaundice; no rigors; tender swelling detected below the right costal margin.

*Operation.*—10/8/1898. Gall-bladder found adherent to omentum, transverse colon, and pylorus; adhesions separated; gall-bladder very much thickened and infiltrated; 116 stones removed from it and cystic duct by scoop; common duct still blocked with stones; condition of patient and extensive adhesions round the duct prevented free exposure, and rendered choledochotomy inadvisable; dilated cystic duct united to duodenum by a Murphy's button; incision in gall-bladder closed, and stitched to aponeurosis; no drainage.

*After-History.*—Good recovery; well when last heard of.

*Gall-stones : Cholecystotomy.*

CASE 227.—Mr. S., aged fifty, seen with Dr. Lambert, Farsley. Four years ago the patient had first attack of pain over the gall-bladder, since which time he had had frequent seizures; occasionally he vomited during an attack, and on one occasion he was slightly jaundiced.

*Operation.*—25/8/1898. Cholecystotomy; gall-bladder full of thick ropy mucus; twelve stones removed from the cystic duct; common duct clear; gall-bladder drained.

*After-History.*—Good recovery; well when last heard of.

*Gall-stones : Cholecystotomy.*

CASE 228.—H. P. G., female, aged twenty-nine, seen with Dr. Ross and Dr. Denby, Manningham. Attacks of colic for three years; at first no jaundice; later jaundice followed attacks, and several gall-stones were found in the motions; absence of physical signs except tenderness between the umbilicus and ninth costal cartilage.

*Operation.*—30/8/1898. Cholecystotomy; gall-stones removed

from the gall-bladder and cystic duct; drainage of the gall-bladder.

*After-History*.—Good recovery.

*Cholecystitis, Infective Cholangitis : Cholecystotomy ; Subsequent Cholecystectomy.*

CASE 229.—Mr. S., aged fifty-six, seen with Dr. Cattle, Nottingham. Sister and brother suffered from gall-stones; four years ago characteristic gall-stone attacks followed by slight jaundice; occasional spasms before and since; a year ago began with ague-like attacks and slight jaundice lasting for six months; loss of flesh about  $1\frac{1}{2}$  stones; tenderness 1 inch above and to the right of the umbilicus; no enlargement of the liver.

*Operation*.—4/9/1898. Cholecystotomy; very firm adhesions of stomach, omentum, and intestine to liver and gall-bladder; gall-bladder shrunken and filled with muco-pus; no gall-stones felt in the ducts; drainage.

*After-History*.—Good recovery; quite well for some weeks, but recurrence of pain. Cholecystectomy performed with good result; in good health, 1903.

*Cancer of Pancreas : Laparotomy.*

CASE 230.—Mr. R., aged sixty, seen with Dr. Dearden, Bradford. Three years ago had pain at the epigastrium; February, 1897, severe pain followed, without jaundice; eleven months ago another attack, followed by jaundice, which had persisted; great loss of flesh; had bled from the bowel.

*Operation*.—6/9/1898. Exploratory; large mass infiltrating liver and involving the head of the pancreas; enlarged gland in gastro-hepatic omentum.

*After-History*.—Recovered from the operation and returned home apparently relieved.

*Chronic Catarrhal Cholecystitis : Cholecystotomy.*

CASE 231.—Mrs. H., aged thirty-five, seen with Dr. Rowe, Cowling. Ten years ago the patient was treated for gastric ulcer; recovered and enjoyed good health up to two years ago; she then had several attacks within a few weeks, of pain in the epigastrium, radiating to the back; pain severe, and accompanied by vomiting and rigors; no jaundice; under treatment she recovered and remained free from pain till November, 1897, when she had attacks of pain accompanied by rigors and followed by jaundice; right lobe of liver enlarged; gall-bladder could not be felt.

*Operation.*—15/9/1898. Gall-bladder exposed, adherent to omentum and colon; distended with mucus; no gall-stones found; gall-bladder drained for a fortnight. Diagnosis: Chronic catarrhal cholecystitis, a sequence of gall-stones.

*After-History.*—Good recovery; no recurrence of attacks.

*Gall-stones, Cancer of Bile-ducts: Cholecystotomy.*

CASE 232.—Miss B., aged forty-eight, seen with Dr. Goldsmith, Bedford. Spasms twenty years ago without jaundice; no recurrence till six weeks ago, when jaundice supervened and continued with rapid loss of flesh and strength, and with nausea and vomiting; tenderness over gall-bladder, but no tumour to be felt; patient very stout.

*Operation.*—21/9/1898. Cholecystotomy; four gall-stones removed from the gall-bladder and cystic duct; tumour felt at the junction of cystic and common duct, hard and nodular; no other gall-stones felt; drainage of the gall-bladder by a tube which was shut off from the peritoneal cavity by suturing the omentum around the opening in the gall-bladder.

*After-History.*—Recovered from the operation and was relieved; wound healed entirely by first intention except at the site of the tube; no bile appeared till the ninth day; it then flowed freely till the fourteenth day, when it ceased, probably owing to the growth advancing to the hepatic duct. After the obstruction became complete the jaundice returned. Life was prolonged for several months, and the patient was freed from serious pain.

*Gall-stones, Apparent Cancer of Liver: Remarkable Relief by Exploration.*

CASE 233.—Mr. F., aged thirty-nine, seen with Dr. McCallum, Kendal. Five well-marked attacks of gall-stones and numerous slighter ones in five years; gall-stones found in the motions; absence of enlargement of the gall-bladder and liver.

*Operation.*—22/9/1898. Exploratory; gall-stones found in the gall-bladder, but gall-bladder and liver infiltrated with what appeared to be cancer, which had, however, not formed sufficiently large nodules to be felt through the abdominal wall.

*After-History.*—Great relief from the operation; jaundice had almost disappeared when he left Leeds at the month end; May 24, 1899, patient very well; has had no pain since the operation, and has gained weight. The good result of exploration in this case is to me quite inexplicable, as the case had every appearance of cancer.

*Gall-stones, Tumour of Cystic Duct : Cholecystectomy and  
Hepatectomy.*

CASE 234.—Miss W., aged forty, seen with Dr. Nicholson Dobie, Keighley. Strong family history of phthisis; in twelve months several attacks of severe pain in the right iliac region, accompanied by swelling in normal situation of the cæcum, and marked tenderness between the anterior superior spine of ilium and umbilicus; each attack was associated with fever, constipation, vomiting, and abdominal swelling, and all signs of local peritonitis over inflamed appendix.

*Operation.*—29/9/1898. Cholecystectomy and hepatectomy; incision over cæcum; viscera matted together by old and recent lymph; after separating adhesions, the gall-bladder was reached at the end of a projecting Riedel's lobe; muco-pus and several gall-stones were removed; tumour of cystic duct felt, and as on incision it gave the appearance of growth, it, with the gall-bladder, was removed by means of an elastic ligature. Mr. Targett reported the tumour to be inflammatory, and not due to tubercle or cancer.

*After-History.*—Satisfactory recovery; quite well four years later.

*Obstructed Bile-duct, Recurring Pain, Jaundice : Cholecystotomy.*

CASE 235.—Mrs. S., aged fifty, seen at the infirmary. Two years' history of attacks of abdominal pain, commencing about the umbilicus, radiating to the back; attacks were of moderate severity, and occurred at frequent intervals; no vomiting or rigors. Three weeks ago, after a severe attack of pain, the patient became jaundiced, with clay-coloured motions and high-coloured urine. Jaundice had persisted, and she had had several attacks of pain; one in the infirmary was very severe. Tender spot above and to the right of the umbilicus; no distended gall-bladder could be felt.

*Operation.*—3/10/1898. Cholecystotomy; no gall-stones felt in the gall-bladder or bile-ducts, but, as jaundice was thought to be obstructive, cholecystotomy was performed. Beyond severe vomiting for the first day or two, there appeared to be no cause for anxiety, but on October 10 the patient died suddenly, apparently from syncope.

*Post-mortem Examination.*—The kidneys were found to be granular, and the capsules very adherent, but beyond this nothing was found to account for death. So far as the operation was concerned, everything was satisfactory. The wound was healed, and there were no signs of peritonitis.

*Gall-stones in Common Duct, Jaundice, Suppurative Cholangitis, Heart Disease : Choledochotomy.*

CASE 236.—Mrs. M., aged fifty-five, seen with Dr. Gordon Black, Harrogate. Six years ago influenza; four months after severe pain over the liver and on the left side of the abdomen; pain off and on for six weeks, when jaundice appeared; since then frequent ague-like attacks with jaundice and fever; great loss of flesh; œdema of the legs; pulse 108, feeble; severe mitral disease and dilated heart, with albuminuria; liver large; swelling at site of gall-bladder hard; no nodules felt in the liver. Patient seen a month before but thought too ill for operation, and general treatment advised, but when seen a month later, as she was manifestly going to die if not relieved, operation was reluctantly decided on to give her a last chance, especially as, under digitalis, the heart seemed to have improved sufficiently to warrant it.

*Operation.*—19/10/1898. Choledochotomy; many adhesions; common bile-duct incised and several gall-stones removed; finger passed up into the cystic and hepatic ducts, which were occupied by gall-stones that were then removed by the scoop; duct sutured; drainage of abdomen.

*After-History.*—Death from exhaustion and heart failure sixth day.

*Gall-stones : Cholecystotomy.*

CASE 237.—Mrs. R., aged forty-seven, seen at the infirmary. Six years' history of attacks of biliary colic accompanied by rigors and vomiting; attacks more frequent and severe during the last six months, usually followed by jaundice, which cleared up between the attacks; tenderness on palpation above and to the right of the umbilicus; no swelling to be felt.

*Operation.*—20/10/1898. Cholecystotomy; thirteen stones removed from the gall-bladder and cystic duct; drainage.

*After-History.*—Good recovery.

*Gall-stones : Cholecystotomy.*

CASE 238.—Mrs. B., aged sixty-two, seen with Dr. Irving, Huddersfield. Attacks of so-called 'visceral neuroses' ten years; no jaundice except once, a year ago, which lasted four days; single faceted gall-stone found in the motions after the attack; urine normal; no heart disease; slight œdema of the ankles; gall-bladder distended and tender.

*Operation.*—22/10/1898. Cholecystotomy; fifty-nine gall-stones removed, varying from the size of a small pea to that of a cherry; drainage of the gall-bladder.

*After-History.*—Good recovery; well, July, 1899.

*Chronic Pancreatitis, Jaundice, and Infective Cholangitis : Exploratory Operation.*

CASE 239.—Mr. D., aged forty-two, seen with Dr. Chaffers, Keighley. Ten years ago an attack of pain in the right hypochondrium ; no jaundice ; free from attacks up to six weeks ago ; he had then had a severe attack of pain in the right hypochondrium radiating to the back and shoulders, accompanied by rigors and vomiting, and followed by jaundice ; jaundice had persisted up to the present ; no swelling to be felt.

*Operation.*—27/10/1898. Exploratory laparotomy ; mass of growth in the head of the pancreas ; wound closed.

*After-History.*—Recovery, with great relief to jaundice. I suspect the enlargement of the head of the pancreas was chronic pancreatitis, as it was too soft for scirrhus. I very freely manipulated it to feel if there was a gall-stone in the termination of the common bile-duct, and this may have dislodged something from the pancreatic duct. Ultimately complete recovery.

*Gall-stones : Cholecystotomy.*

CASE 240.—Mr. W., aged sixty-two, seen with Dr. Brown, Denby Dale. Attacks of abdominal pain, more in lower abdomen, for twenty years, sometimes followed by jaundice, occasionally followed by vomiting, which relieved the pain ; loss of flesh, general feebleness, and low specific gravity of urine ; tenderness below and to the right of the umbilicus ; markedly pulsating aorta with questionable tumour above the umbilicus ; fulness in the gall-bladder region. At first thought to be too ill for operation, but, after watching him for a fortnight, with some improvement, operation thought feasible.

*Operation.*—16/11/1898. Cholecystotomy ; 285 stones removed from the gall-bladder and cystic duct. Smooth recovery from operation, and wound healed. Cerebral symptoms and partial paralysis developed on the thirtieth day, and ended in coma on the thirty-fourth day from operation.

*After-History.*—Recovery from the operation, but death thirty-fourth day. Autopsy : Cerebral thrombosis ; no peritonitis ; a small gall-stone found in the common duct ; kidneys diseased.

*Gall-stones, Ulceration and Perforation of Gall-bladder : Cholecystotomy.*

CASE 241.—Mrs. I., aged forty-eight, seen with Dr. Irving, Huddersfield. Spasms for fifteen years, lately more frequent ; loss of 4 stones 5 pounds in thirteen years ; loss of 1 stone in weight lately ; attacks of pain began at the epigastrium and passed to the shoulder ; jaundice once after an attack ; albuminuria, but no tubercasts ; tenderness over the gall-bladder ; no tumour.



*Operation.*—21/11/1898. Cholecystotomy; stone ulcerating its way out at the fundus, and half extruded into peritoneal cavity; no adhesion at that part, but adhesions lower down.

*After-History.*—Good recovery.

*Cancer of Head of Pancreas, Jaundice : Cholecystenterostomy.*

CASE 242.—Mr. J., aged sixty-one, seen at the infirmary. Jaundice for eight weeks, with little pain; no history of gall-stones; feeling of discomfort over the gall-bladder, which was distended; loss of weight very considerable.

*Operation.*—1/12/1898. Cholecystenterostomy; cancer of the head of the pancreas; Murphy's button used.

*After-History.*—Recovery; button passed sixteenth day.

*Gall-stone in Ampulla of Vater, Sub-Diaphragmatic Abscess : Duodeno-Choledochotomy.*

CASE 243.—Mrs. L., aged forty-nine, seen with Dr. Lee, Dewsbury. Spasms for five years; jaundice first three and a half years ago; sickness and jaundice without pain off and on since; jaundice continuous for five weeks; ague-like attacks two months ago, and five or six weeks since; examination negative; no tenderness; no tumour; great loss of flesh; some continuous fever, and great feebleness.

*Operation.*—1/12/1898. Duodeno-choledochotomy; gall-stone in the ampulla of Vater removed through the duodenum; no drainage; wound reopened the seventh day on account of fever and pain in the abdomen, but nothing abnormal found.

*After-History.*—Death sixteenth day. Autopsy: duodenal wound healed; collection of pus between the liver and diaphragm evidently of some duration, but not discovered at the time of operation, or on reopening the wound.

*Catarrhal Cholecystitis : Cholecystotomy ; Gastrolysis.*

CASE 244.—Mr. D., aged fifty-two, seen with Dr. Holdsworth, Birmingham, and Mr. R. N. Hartley, Leeds. First attack fifteen years ago, numerous seizures since, and recurring more frequently recently; latterly stomach troubles; no tumour; tenderness over the gall-bladder; dilatation of stomach.

*Operation.*—14/12/1898. Cholecystotomy; contracted gall-bladder; adhesion of pylorus and intestine to it and to liver; gall-bladder much thickened; cystic duct strictured; drainage; funnel of omentum used to shut off the peritoneal cavity; visceral adhesions separated.

*After-History.*—Good recovery; quite well, 1902.

*Catarrhal Cholecystitis, Dilated Stomach : Cholecystotomy ;  
Gastrolysis.*

CASE 245.—Mrs. N., aged fifty-seven, seen with Dr. Halliday, Armley. Well till eight months ago; never had spasms or jaundice; six attacks in eight months; pain severe, beginning at the epigastrium, and passing to the right infrascapular region; examination negative but for tenderness over the gall-bladder.

*Operation.*—15/12/1898. Cholecystotomy; much adherent and dilated stomach; contracted gall-bladder, containing thick mucus; separation of adhesions; tube fixed into the gall-bladder and isolated by iodoform gauze.

*After-History.*—Good recovery.

*Gall-stones, Empyema of Gall-bladder : Cholecystotomy.*

CASE 246.—Mrs. P., aged fifty-nine, seen with Dr. l'Anson, Whitehaven. Stomach troubles for years, but no definite biliary colic till two years ago, since which many. With last attack rigor and elevated temperature, but no jaundice; distended gall-bladder.

*Operation.*—17/12/1898. Inflamed gall-bladder, containing about 4 ounces of pus; single stone the size of a starling's egg in cystic duct worked back to the gall-bladder and extracted; common duct clear.

*After-History.*—Good recovery; well, December, 1899.

*Gall-stones, Jaundice, and Distended Gall-bladder : Cholecystotomy.*

CASE 247.—Mr. R., aged forty-seven, seen with Dr. Moore, Holbeck. Gall-stone colic at intervals for four and a half years, with intermittent jaundice; no rigors; jaundice present; gall-bladder distended and tender.

*Operation.*—23/12/1898. Cholecystotomy; 180 stones removed from gall-bladder and ducts varying from size of a pea to that of a marble.

*After-History.*—Good recovery.

*Gall-stones, Heart Disease : Cholecystotomy.*

CASE 248.—Mr. D. S. B., aged sixty-six, seen with Dr. Barrs, Leeds. First attack eleven years ago; intermission for two years; since more frequent; three attacks last month. Distension of gall-bladder for eight years; slight jaundice almost continuous for years, but worse after each seizure; never extreme; had had mitral disease for years; recently slight œdema of the feet at nights; tenderness over gall-bladder; no tumour; no dilatation of stomach; urine normal; loud mitral regurgitant murmur; slight jaundice.

*Operation.*—6/1/1899. Cholecystotomy; single stone in shrunken gall-bladder, which was very friable; tube stitched into the gall-bladder, which could not be brought up to surface; drainage of the right kidney pouch.

*After-History.*—Little immediate shock, but failure of the heart on the second day. Death the fourth day, with symptoms of pneumonia; no peritonitis.

*Gall-stones, Dilated Stomach: Cholecystotomy; Gastrolysis.*

CASE 249.—M. H., female, aged thirty-one, seen with Dr. Bruce, Grimsby. Indefinitely ailing three and a half years; five attacks of acute gall-stone colic during the last year; never jaundiced; no rigors; pain usually began at the left side, but always passed to the right shoulder; no tumour; tenderness over the gall-bladder; dilated stomach.

*Operation.*—13/1/1899. Cholecystotomy; four stones removed from the cystic duct and gall-bladder; gall-bladder slightly distended; pylorus adherent; adhesions broken down.

*After-History.*—Persistent vomiting for four days, followed by a good recovery. At no time was there distension, nor did the pulse-rate rise.

*Biliary Fistula: Cholecystectomy; Cystodochenterostomy.*

CASE 250.—Mrs. S., aged forty-eight, seen with Dr. Saunders, Wales. Cholecystotomy, April, 1898; wound healed and patient made a good recovery, but some time after, a fistula developed and continued to discharge muco-pus and bile, closing from time to time, only, however, to require opening up. As each attack was accompanied by fever and considerable distress, and as swelling could be felt beneath the right costal margin, operation was advised.

*Operation.*—19/1/1899. Cholecystectomy and cystodochenterostomy; peritoneal cavity opened; numerous adhesions found; all landmarks obliterated; gall-bladder and ducts examined, but no evidence of blockage; chain of hardened glands felt along the course of the common duct; gall-bladder contracted, and as it was lacerated in detaching adhesions, it was removed and the cystic duct connected by means of a Murphy's button with the duodenum; the liver was slightly lacerated in separating adhesions.

*After-History.*—Imperfect drainage and extravasation of infected bile from the torn surface of the liver was responsible for the fatality, which occurred on the fifth day. The artificial union between the bile-duct and gut was perfect.

*Cancer of Pancreas, Jaundice, Ascites : Cholecystotomy.*

CASE 251.—Mrs. M. K., aged thirty-four, seen with Dr. Coombs, Bedford. No history of spasms; influenza, December 3, 1898; patient became jaundiced on December 20, 1898; without pain; the jaundice continued. On January 16, 1899, she became feverish; temperature  $104^{\circ}$ ; fever continued, hectic type; at first liver enlarged and very tender; cough throughout always provoked by pressure on the gall-bladder; no physical signs in the chest; never had pain; the pulse was slow throughout; ascites present, with deep jaundice and fever.

*Operation.*—24/1/1899. Exploratory; blood effusion in the sheath of rectus, and a large amount of ascitic fluid let out; no gall-stones or tumour felt, but doubtful swelling at the head of the pancreas, and cirrhosis of the liver; disease probably cancer of the papilla, with extension to pancreas and with subsequent infective cholangitis; gall-bladder drained.

*After-History.*—Shock and exhaustion led to death on the third day. No autopsy.

*Cancer of Liver, Gall-bladder, and Cystic Duct, with Gall-stones : Laparotomy.*

CASE 252.—Mr. B., aged fifty-five, seen with Dr. Batchelor, Dunedin, New Zealand. Attacks of biliary colic for twenty-five years till January, 1893, then an interval till July, 1898, when he had dyspeptic troubles. Jaundice in August without any colic, and persisting since; no pain or rigor since; great loss of flesh; liver enlarged; lower border felt 3 inches below the ribs; nodule felt in the epigastrium; deep jaundice present.

*Operation.*—25/2/1899. Exploratory; cancer of the gall-bladder and cystic duct, with secondary deposit in the liver; many gall-stones in the gall-bladder. Wound healed by first intention.

*After-History.*—Patient seemed to pick up strength after the operation, and returned to London, where he died, apparently from syncope, seven weeks after the operation.

*Fistula discharging Muco-pus, Epithelioma of Gall-bladder : Cholecystotomy.*

CASE 253.—Mrs. D., aged fifty-two, seen with Dr. Ferguson, Thirsk. Cholecystotomy, January, 1898; well till September, 1898, when she had had pain and tenderness in the gall-bladder region. In October an abscess formed and burst externally, since which time there had been a muco-purulent discharge from the sinus.

*Operation.*—22/1/1899. Cholecystotomy; large mass, hard and irregular, found where the gall-bladder was attached to the

parietes ; part removed for examination ; tube inserted into the gall-bladder.

*After-History.*—Recovery ; tumour found to be cylindrical epithelioma. The wound healed, and the patient returned home within a month.

*Gall-stones : Cholecystotomy.*

CASE 254.—Mrs. D., aged fifty-six, seen with Dr. Mann and Dr. Woodcock, Leeds. Spasms three years, with intermittent jaundice ; loss of flesh ; distended gall-bladder, tender ; slight jaundice present.

*Operation.*—2/3/1899. Cholecystotomy ; dumb-bell-shaped stone 1½ inches long in gall-bladder ; another smaller stone blocking the cystic duct pressed back into the gall-bladder and extracted.

*After-History.*—Good recovery.

*Gall-stones in Ampulla, Adhesions : Duodeno-Choledochotomy.—Acute Dilatation of Stomach.*

CASE 255.—Miss A. G., aged twenty-seven, seen with Dr. Thompson, Mytholmroyd. First attack fifteen months ago, with jaundice ; never free from jaundice since, but increasing with each seizure ; latterly very marked ; recently, slight epistaxis ; no rigors ; deep jaundice ; tumour in the right hypochondrium like a distended gall-bladder ; liver dulness increased.

*Operation.*—9/3/1899.—Duodeno-choledochotomy ; Riedel's lobe and distended gall-bladder ; stone impacted at the ampulla of Vater removed through duodenum ; another stone higher up removed by the scoop ; duodenal wound closed ; gauze-drain down to incision.

*After-History.*—Well until the evening of the 15th, with a normal pulse and temperature ; sudden rise of pulse and vomiting, which continued till the 17th, when the patient died. Post-mortem : No peritonitis ; superficial wound and the wound in the duodenum healed ; stomach much dilated ; omental adhesion binding the first part of the duodenum to the pyloric end of the stomach. Death apparently due to heart failure from pressure of acutely dilated stomach ; nothing else found to account for the fatal result.

*Gall-stones in Common Duct, Jaundice and Infective Cholangitis : Cholecystenterostomy.*

CASE 256.—Mr. W., aged sixty-five, seen with Dr. Paton, Sowerby Bridge. For a year repeated attacks of gall-stone colic, now recurring every eight days ; lately followed by jaundice, varying in severity, but never absent ; attacks latterly associated

with rigors ; no gastric disturbance ; no tenderness ; liver somewhat depressed ; no tumour ; heart-sounds weak ; arteries atheromatous ; albuminuria ; patient emaciated.

*Operation.*—10/3/1899. Cholecystenterostomy ; large stone in the common duct, but the patient was too weak to bear a prolonged operation ; Murphy's button passed on the tenth day.

*After-History.*—Recovery ; patient very weak from the third to the seventh day, with some delirium, after which a good recovery ; relieved for some months, but then some recurrence of symptoms.

*Cholecystitis : Cholecystectomy.*

CASE 257.—Mr. S., aged fifty-six, seen with Dr. Anderson, Nottingham. Cholecystotomy for contracted gall-bladder and adhesions, September 4, 1898, followed by relief for some time, but rigors recurred.

*Operation.*—9/3/1899. Cholecystectomy ; removal of gall-bladder containing muco-pus ; cystic duct apparently strictured ; no bile flowed at the time of operation, but drainage-tube inserted down to the cystic duct ; free flow of bile following day.

*After-History.*—Good recovery ; in good health, 1903.

*Gall-stones in Common Duct, Jaundice and Infective Cholangitis :  
Choledochotomy and Cholecystotomy.*

CASE 258.—Mrs. B., aged fifty-six, seen with Sir Henry Blanc and Dr. McDougall, Cannes. Gall-stone colic twenty years ago ; no recurrence till January, 1898, since which time frequent attacks ; jaundice persisted for six months, but varying in intensity with the seizures ; for some weeks elevation of temperature ( $101^{\circ}$ ,  $102^{\circ}$ , and  $103^{\circ}$ ) ; in the evening chilly feeling, but no rigors ; great loss of flesh.

*Operation.*—16/3/1899. Choledochotomy ; gall-bladder contracted on a faceted gall-stone size of a bean ; floating gall-stone in a much dilated common duct removed by an incision in the duct ; gall-bladder drained ; gauze-drain into the right kidney-pouch removed at the end of thirty-six hours.

*After-History.*—Good recovery ; well, 1903.

*Gall-stones, Empyema of Gall-bladder : Choledochotomy, Cholecystotomy.*

CASE 259.—Mrs. G., aged forty-seven, seen with Dr. Lambert, Farsley. Repeated gall-stone seizures for two years ; no jaundice ; no shivers ; distended gall-bladder, which was tender ; no fever.

*Operation.*—23/3/1899. Choledochotomy ; empyema of gall-bladder ; many small stones in the gall-bladder ; one large stone

removed from the cystic duct by choledochotomy; drainage of the gall-bladder, and a gauze-drain down to the incision in the duct.

*After-History.*—Cured.

*Typhoidal Cholecystitis, Gall-stones, Adhesions : Gastrolysis, etc.*

CASE 260.—Mr. T., aged thirty, seen with Dr. Harvey, London, and Dr. Turner, York. Attacks of gall stone colic for twelve years; typhoid fever in September, 1898; very severe attack of infective cholangitis in January, 1899. This cleared off, and the patient was in fair condition in April. Tenderness over the gall-bladder region; no tumour; no dilatation of the stomach; pulse soft but slow.

*Operation.*—4/5/1899. Separation of visceral adhesions to gall-bladder and bile-ducts. At operation many adhesions of stomach to the gall-bladder and liver; small gall-bladder very high up under the ribs; several stones impacted deeply in the cystic duct. Under anæsthetic the patient's pulse ran up to 150, and only separation of adhesions was done, as the gall-stones seemed fixed, and it was thought they might not give further trouble, the later attacks being probably due to visceral adhesions.

*After-History.*—Good recovery; well, December, 1899; regained his lost weight; did good service throughout the Boer War.

*Gall-stones in Common Duct, Jaundice and Infective Cholangitis :  
Choledochotomy and Cholecystotomy.*

CASE 261.—Mrs. A., aged forty-eight, seen with Dr. Bramwell, Cheltenham. Innumerable attacks of gall-stone colic, usually followed by jaundice, sometimes lasting a month, but lately more transient; attacks recently milder, but more frequent, and latterly there had been rigors with the seizures; attacks of localized peritonitis twelve months ago; slight tinge of jaundice; physical examination negative.

*Operation.*—6/5/1899. Choledochotomy; numerous adhesions broken down; numerous stones removed from the gall-bladder and the cystic duct; three removed from the common duct through two incisions, as one of the stones was encysted and required separate incision; drainage of the gall-bladder and right kidney-pouch; both wounds in the common duct stitched up.

*After-History.*—Very considerable discharge from the kidney-pouch for a week, otherwise a good recovery; no peritonitis; well, 1903.

*Gall-stones, Pain always Left Side : Cholecystotomy ; Gastrolysis.*

CASE 262.—Mrs. H., seen with Dr. Brown, Roundhay. Typhoid fever twenty years ago, with cholecystitis; attacks of spasms on left side of abdomen for years; no jaundice till November, 1898, since which time jaundice after each attack; no rigors; lost  $2\frac{1}{2}$  stones in weight in twelve months. Pain began at the left of the epigastrium, and radiated to the back and to both shoulders; vomiting a marked feature of the case; never vomited blood; latterly pain rather more on the right side, but still most marked on the left; tenderness under the left costal margin and over the gall-bladder, but no tumour felt.

*Operation.*—8/5/1899. Cholecystotomy; five stones removed from the gall-bladder, one manipulated back from the cystic duct; pylorus adherent to the cystic duct just over the stone; adhesions of stomach to the liver and to ducts broken down.

*After-History.*—Good recovery; well, December, 1899.

*Jaundice, Infective Cholangitis : Adhesions stricturing Common Duct Separated ; Gastrolysis.*

CASE 263.—Mrs. F., aged forty-two, seen with Dr. Woodyatt, Halifax. Gall-stone colic every three weeks for two years; jaundiced for three months; ague-like attacks recently; no tumour; tenderness over the gall-bladder; well-marked jaundice.

*Operation.*—8/5/1899. Separation of adhesions around common duct; very dense adhesions of stomach and pylorus to the gall-bladder and liver; gall-bladder shrunken; common duct strictured by adhesions; no gall-stones; adhesions broken down.

*After-History.*—Good recovery; jaundice disappeared before the patient returned home within the month; no recurrence of rigors.

*Gall-stones, Empyema of Gall-bladder : Cholecystotomy.*

CASE 264.—Mr. M., aged fifty-one, seen with Dr. Ashton and Dr. Rabagliati, Bradford. Indigestion for years, but pain at lower part of abdomen for ten months; constipation; loss of flesh; no diarrhœa, but bleeding from rectum for some time; enlargement over the gall-bladder, tender; dilatation of the stomach; piles; no stricture of rectum; slight icterus.

*Operation.*—10/6/1899. Cholecystotomy; distended gall-bladder containing pus; single stone the size of a hazel-nut in distal end of the cystic duct removed through the gall-bladder; drainage.

*After-History.*—Good recovery. Well in 1902.



*Gall-stones : Cholecystotomy.*

CASE 265.—Mrs. P., aged fifty-seven, seen with Dr. McCallum, Kendal. First attack of gall-stone colic fourteen months ago, followed by slight jaundice; four attacks in June, 1898; respite till December, when slight seizure; four attacks since July; no rigors; no jaundice; no tumour; tenderness over the gall-bladder.

*Operation.*—12/5/1899. Cholecystotomy; fifty-two gall-stones, almost all small, removed from gall-bladder; drainage for one week.

*After-History.*—Good recovery.

*Cancer of Pancreas, Great Pain : Cholecystenterostomy.*

CASE 266.—Mr. L., aged fifty-nine, seen with Dr. Holloway and Dr. Bruce, Birmingham. Failure of health for a year, but otherwise well till six months ago; since then attacks of pain, beginning in lower abdomen and extending to the back and upper abdomen, never to the shoulders; no fever; no rigors; jaundice persisted for two months; vomiting, no large quantity, and no blood; great loss of weight; pain every twelve hours, requiring morphia; spare man, deeply jaundiced; pulse weak, but regular; nodular swelling, hard and slightly tender, in region of the gall-bladder and towards the middle-line; distended gall-bladder.

*Operation.*—16/5/1899. Cholecystenterostomy; cancer of the pancreas; Murphy's button used.

*After-History.*—Death; cardiac failure fourth day; no peritonitis.

*Gall-stones : Cholecystotomy.*

CASE 267.—Mr. B., aged forty-eight, seen with Dr. Mackenzie, Burnley. Five typical attacks of gall-stone colic during the last six months, associated with jaundice; no ague-like attacks in the intervals; tenderness in the usual situation; slight icteric tinge; no tumour.

*Operation.*—18/5/1899. Cholecystotomy; adhesions around the gall-bladder separated; several small stones removed from the gall-bladder, and one large stone from the cystic duct at the junction with the common duct.

*After-History.*—Acute ether bronchitis, followed by a good recovery.

*Gall-stones, Sub-diaphragmatic Abscess : Drainage of Abscess ; Cholecystotomy.*

CASE 268.—Mrs. W., aged forty-four, seen with Dr. Lambert, Farsley. Frequent gall-stone attacks for a year or more, followed by jaundice, and sometimes by shivering attacks. Of late the

attacks occurred as often as two or three times a week ; loss of flesh and strength ; swelling below the right costal margin, with marked tenderness ; slight icteric tinge, but no marked jaundice.

*Operation.*—1/6/1899. Cholecystotomy ; gall-bladder much contracted ; many adhesions, during separation of which pus escaped from a small abscess cavity in the liver and from between it and the diaphragm, to which it was adherent ; several stones removed from the gall-bladder ; drainage of the gall-bladder ; abscess cavity packed with iodoform gauze.

*After-History.*—Complete recovery.

*Mucous Fistula, Gall-stones : Cholecystotomy.*

CASE 269.—Mrs. W., aged forty-four, seen with Dr. Mason, Leeds. Cholecystotomy eighteen months before ; mucous fistula persisted ; six weeks ago severe attacks of pain ; another two weeks ago ; in latter a small gall-stone was passed through the fistula ; both followed by jaundice.

*Operation.*—15/6/1899. Cholecystotomy ; sinus dilated after slight incision ; several stones removed by forceps ; drainage.

*After-History.*—Good recovery.

*Jaundice, Adhesions, Vertical Displacement of Liver : Laparotomy.*

CASE 270.—Mrs. M., aged fifty-two, seen with Dr. Tyrie, Keighley. History of gall-stone colic ; attacks at intervals of seventeen years ; four in the last month, usually followed by jaundice ; ague-like attacks recently, with loss of flesh and strength ; tenderness in the usual situation ; slight icterus.

*Operation.*—25/5/1899. Laparotomy. The liver was found displaced vertically, the left lobe being high up under the diaphragm, and the usual under-surface facing to the left. The adhesions were so extensive, and the patient was taking the anæsthetic so badly—the pulse having gone up to 150—that I felt it wiser not to follow up the operation after examining in the presumed position of the gall-bladder and ducts, and not feeling any calculi.

*After-History.*—Complete recovery followed, and after the operation the jaundice cleared, and there were no further attacks of pain or fever.

*Gall-stones in Common Duct, Jaundice, and Infective Cholangitis :  
Choledochotomy.*

CASE 271.—Mrs. A., aged forty-seven, seen with Dr. Bates, Ilkley. Spasms for ten years ; no icterus till June, 1898, when jaundiced for a week ; had been jaundiced off and on since Christmas, and without intermission for two months ; frequent ague-like attacks and high fever ; great loss of flesh ; slight bleeding from

the nose ; liver enlarged, and probably some enlargement of the spleen ; no tumour ; tenderness just above the umbilicus.

*Operation.*—15/6/1899. Duodeno-choledochotomy ; many old-standing adhesions of stomach, pylorus, and colon to the gall-bladder and liver separated ; four floating gall stones removed from the common duct by an incision through the duodenum ; little hæmorrhage ; calcium chloride given ; drainage of right kidney-pouch through a counter-opening at the side.

*After-History.*—Recovery ; December, 1899, ill with cancer of the liver.

*Gall-stones : Cholecystotomy.*

CASE 272.—Mr. G., aged forty-six, seen at the infirmary. Frequent attacks of gall-stone colic followed by jaundice ; attacks now about twice a week ; slight icteric tinge ; slight continuous pain over the gall-bladder region, aggravated by pressure ; no tumour.

*Operation.*—22/6/1899. Cholecystotomy ; 491 gall-stones removed from the gall-bladder and cystic duct down to the common duct, which was clear ; drainage.

*After-History.*—Good recovery.

*Gall-stones, Cancer of Liver, Infective Cholangitis : Hepatectomy and Cholecystenterostomy.*

CASE 273.—Mr. B., aged forty-six, seen with Dr. Fisher, Skipton. Gall-stone attacks for seven years ; symptoms of floating stone in common duct, 1897 ; infective cholangitis, 1899 ; loss of 4 stones in weight.

*Operation.*—26/6/1899. Hepatectomy and cholecystenterostomy ; tumour of liver found and excised ; number of small stones in the common duct crushed ; Murphy's button used.

*After-History.*—Good recovery ; rapidly gained a stone in weight ; well, 1903, and of normal weight.

*Gall-stones in Common Duct : Choledochotomy.*

CASE 274.—Mr. G., aged forty-six, seen at the infirmary. Symptoms of gall-stone colic, recurring almost weekly, for nearly eleven months, each attack followed by rigors and deepening of jaundice, which latterly has been persistent ; great loss of flesh ; liver moderately enlarged ; irregular temperature with rigors. No enlargement of the gall-bladder to be felt.

*Operation.*—6/7/1899. Choledochotomy ; single stone removed from the gall-bladder ; two stones removed from the common

duct through an incision into the duct; many adhesions broken down; drainage.

*After-History.*—Death; persistent vomiting, and death from exhaustion on the fourth day.

*Gall-stone : Cholecystotomy.*

CASE 275.—Mrs. J., aged thirty-seven, seen with Dr. Haswell, Penrith. Cholelithic attacks ten years off and on; less frequent the last five years, till January, 1899; occasional jaundice after the seizures; loss of flesh; tenderness over the gall-bladder; distinct swelling.

*Operation.*—15/7/1899. Cholecystotomy; dilated gall-bladder; single stone impacted in the cystic duct; few adhesions.

*After-History.*—Good recovery.

*Gall-stones, Cancer of Common Duct : Cholecystotomy under Cocaine.*

CASE 276.—Mrs. B., aged sixty-eight, seen at the infirmary. Spasms since adolescence; in later years they occurred once a month; before this attack no jaundice. Present illness began in April with a seizure like gall-stone colic; jaundice at the end of a week, which had persisted since; tenderness and pain under the right costal margin; no rigors; abdomen distended; no visible peristalsis; tumour hard, somewhat irregular, and fixed in the gall-bladder region; patient very much jaundiced; very weak; cardiac disease.

*Operation.*—20/7/1899. Cholecystotomy; gall-bladder simply opened and stitched under cocaine; no attempt made to remove the stones which were felt, as patient too ill.

*After-History.*—Death; oozing from the wound for two days; patient gradually sank. Post-mortem examination: Two large stones in the gall-bladder; at the junction of the cystic, hepatic, and common ducts a cancerous tumour about the size of a filbert; no adhesions; duct completely occluded; no peritonitis.

*Catarrhal Cholecystitis, Dilated Stomach : Cholecystotomy ; Gastrolysis.*

CASE 277.—Mr. C., aged thirty-one, seen with Dr. Turner, York. Influenza, February, 1898; biliary colic March the same year, with jaundice; slight recurring attacks till January, 1899, when more severe attack with jaundice for six weeks, which completely cleared; milder attacks since. For last five months stomach symptoms most marked feature, and loss of weight to the extent of 2 stones in sixteen months; rigid right rectus; tenderness below the ninth costal cartilage; no jaundice; dilatation of the stomach.

*Operation.*—22/8/1899. Cholecystotomy; detachment of adhe-

sions; markedly thickened gall-bladder; inspissated mucus; no gall-stones; pylorus intimately adherent to the cystic duct; considerable adhesions of stomach to the liver.

*After-History.*—Good recovery. Served all through the Boer War, and was very well.

*Recurrent Pain, Adhesion, Catarrhal Cholecystitis: Cholecystotomy; Gastrolysis.*

CASE 278.—Mr. S., aged fifty-one, seen with Dr. Tait, Mansfield. Distinct gall-stone attack a year ago, not followed by jaundice; since then a seizure each month; twice jaundiced; the pain always passes to the right shoulder-blade, though there is considerable stomach trouble; loss of weight, 3 stones; tenderness over the gall-bladder; no tumour.

*Operation.*—24/8/1899. Cholecystotomy; very extensive adhesions of stomach and colon to the gall-bladder, liver, and anterior abdominal wall; pylorus adherent to the cystic duct; gall-bladder very much thickened and shrunken, containing inspissated mucus; no gall-stones; drainage for ten days.

*After-History.*—Good recovery.

*Gall-stone in Common Duct, Jaundice: Choledochotomy; Hæmatemesis.*

CASE 279.—Mrs. K., aged forty-nine, seen with Dr. Fisher, Skipton. Gall-stone attack followed by jaundice twelve years ago; freedom from severe seizures for ten years, but had spasms and painful digestion; several attacks since; marked loss of flesh; dilatation of the stomach well marked; hard swelling felt beneath the ribs; slight icterus; albuminuria.

*Operation.*—6/9/1899. Choledochotomy; numerous adhesions separated; gall-bladder contracted; common duct as large as small intestine; duct incised, and two gall-stones size of small Brazil nuts removed; duct sutured; lumbar drainage.

*After-History.*—Violent hæmatemesis twelve hours after operation, and death from exhaustion within thirty hours. No signs of peritonitis or of bleeding other than gastric.

*Gall-stones, Distended Gall-bladder: Cholecystotomy.*

CASE 280.—Mrs. M., aged thirty-seven, seen with Dr. Murphy, Leeds. History of spasms for ten years, much more frequent during the past twelve months; distended gall-bladder with constant pain for six months; great loss of flesh; no jaundice.

*Operation.*—24/8/1899. Cholecystotomy; distended gall-bladder containing cloudy mucus; one small and two large calculi removed from the cystic duct through an incision in the gall-bladder; drainage.

*After-History.*—Good recovery.

*Gall-stones, Empyema of Gall-bladder, Dilatation of Stomach :  
Cholecystotomy ; Gastrolysis.*

CASE 281.—Mrs. I., aged sixty-two, seen with Prof. C. J. Wright, Leeds, and Dr. Starling, Tunbridge Wells. Gall-stone symptoms for years ; seen a year ago and operation urged ; rigors and deepening of the jaundice during year before operation, with great loss of flesh ; dilatation of the stomach.

*Operation.*—21/9/1899. Cholecystotomy ; 2 ounces of pus in the gall-bladder, which was firmly adherent to the colon and stomach ; one large stone removed from the gall-bladder, and two larger ones from the cystic duct ; at the site of impaction of the lowest stone there was thickening of the duct, probably inflammatory ; stomach much dilated ; pylorus kinked.

*After-History.*—Uninterrupted recovery.

*Chronic Pancreatitis, Jaundice : Cholecystotomy.*

CASE 282.—Emma W., aged thirty-five, seen at the Leeds General Infirmary. Attacks of pain in the upper abdominal region for twelve years ; lately they had become more frequent. The seizures began with pain in the epigastrium, accompanied by cold sweats and faintness ; jaundice followed, and was intensified by each attack. No swelling of the liver or gall-bladder to be made out on admission.

*Operation.*—21/9/1899. Cholecystotomy ; thickened gall-bladder, but no gall-stones ; the lower part of the common duct was overlaid and compressed by a well-marked swelling of the pancreas, which was hard (chronic pancreatitis).

*After-History.*—Recovery.

*Gall-stones : Cholecystotomy.*

CASE 283.—Margaret F., aged forty-four, seen at the Leeds General Infirmary. For twelve months had had frequent attacks of biliary colic, accompanied by jaundice, and lately the patient had never been free from pain.

*Operation.*—28/9/1899. Cholecystotomy ; gall-bladder distended, containing four calculi.

*After-History.*—The patient made a good recovery.

*Gall-stones : Cholecystotomy.*

CASE 284.—Mrs. R., aged forty-five, seen with Dr. Greig. Cholelithic attacks for twenty-four years ; at first no jaundice, but latterly after each attack ; recent attacks more severe ; some loss of flesh ; dilatation of the stomach ; tenderness 1 inch to the right of and above the umbilicus ; no enlargement of the gall-bladder or liver.

*Operation.*—14/10/1899. Cholecystotomy; twenty-eight stones removed from the gall-bladder; cystic duct found strictured; adhesions separated; drainage, twelve days.

*After-History.*—Good recovery, but slight attack of pain one month after operation, probably from the passage of inspissated mucus; January 28, 1900, had had no further trouble; felt very well.

*Chronic Pancreatitis, Jaundice : Cholecystenterostomy.*

CASE 285.—Mrs. H., aged fifty-one, seen with Dr. Squance, Sunderland. Attacks of cholelithiasis for three years; during the past fourteen weeks attacks frequent and severe, and jaundice practically continuous; loss of flesh; no rigors; no tumour noticed; no enlargement of the gall-bladder or liver; tenderness in the epigastrium; slight jaundice; slight albuminuria; no œdema of the feet.

*Operation.*—23/10/1899. Cholecystenterostomy; fifteen gall-stones removed from the gall-bladder; large mass, nodular and hard at the head of the pancreas; Murphy's button used to join the gall-bladder to the duodenum.

*After-History.*—Very good recovery; improvement immediate. Tumour; chronic pancreatitis; within two months had gained 10 pounds in weight; well in 1903.

*Cancer of Gall-bladder : Cholecystectomy.*

CASE 286.—Mr. W., aged forty-eight, seen with Dr. Wilson, Paddock. For over ten years spasms at intervals of one to three months; latterly they occurred every week; now constant pain; continuous jaundice for six weeks; bad colour for a year; no rigors; lost 2 stones 4 pounds since June. Enlargement of the right lobe of the liver, and probably of the gall-bladder; tenderness over the gall-bladder and common duct; jaundice and albuminuria.

*Operation.*—30/10/1899. Cancer of the gall-bladder and cystic duct; cholecystectomy and ligature of the cystic, close to the common duct.

*After-History.*—Good recovery; January, 1900, report to say patient feeling well and improving every day.

*Chronic Pancreatitis, with Gall-stone in the Common Bile-duct, Suppurative Cholangitis, Abscess of Liver : Cholecystenterostomy. — Relief; Relapse.*

CASE 287.—Mr. J. F., aged forty-five, residing at Queensbury, was admitted into the Leeds General Infirmary under my care on November 3, 1899, suffering from jaundice, with repeated attacks of pain and ague-like seizures. He had been well up to thirteen

months before his admission, when the attacks began, and since their onset he had lost 6 stones in weight. Jaundice followed the first seizure and persisted, but after each attack of pain it was more intense. He was so weak and ill that it was feared he could not bear an operation. An enlargement of the right lobe of the liver could be felt, and on its inner side in the mid-line just above the umbilicus there was another tumour situated behind the stomach. On November 9 an operation was performed on a heated table with the patient enveloped in wool, an injection of 10 minims of solution of strychnia having been previously given. On opening the abdomen, an enlargement of the right lobe of the liver was seen, the gall-bladder was found shrunken under adhesions, a floating gall-stone too hard to crush was felt in the common duct, and a hard nodular tumour of the head of the pancreas was discovered. As the latter was thought to be malignant and the patient was extremely feeble, choledochotomy was not performed, but the gall-bladder was connected to the duodenum by a Murphy's button in order to give temporary relief to the jaundice, fever, and pain. He had a severe rigor on the night of operation, but afterwards progressed satisfactorily, and recovered from the operation. The button passed on the twelfth day, and as he had gained some weight and was taking his food well, it was thought that the operation was going to be of real benefit to him. The subsequent history of the case was as follows: On December 8 (a month and a day after operation) he had a feeling of chilliness, and a temperature of  $101^{\circ}$  F. followed for two days, his temperature being afterwards normal for twelve days, when he had a rigor and a return of the jaundice. From this time, although he got up every day, he gradually became weaker, and in January, 1900, he developed bronchitis, which ushered in the final scene. At the post-mortem examination the peritoneum was found to be free from inflammation, and the gall-bladder was found to be connected to the duodenum  $1\frac{1}{2}$  inches beyond the pylorus, but the opening had contracted so that it would only admit a fine probe. The common bile-duct was dilated and ulcerated, and it contained a gall-stone of the size of a filbert. The liver was considerably enlarged, and the right lobe was occupied by an abscess containing thick, slimy muco-pus. The walls of the abscess cavity were ragged and ill-defined, and it reached nearly to the surface both in front and behind. It was doubtless the result of the suppurative cholangitis which was present. The pancreas was much indurated about the head, and, together with the indurated tissues in the small omentum, presented on palpation the sensation of a tumour. On section it presented to the naked eye the appearance of chronic inflammation



rather than growth, and on microscopical examination this view was confirmed, there being a great excess of interstitial fibrous tissue, but no sign of cancer.

*Suppurative Cholangitis, Gall-stones in Common Duct : Duodeno-Choledochotomy : Duodenal Fistula.*

CASE 288.—Mrs. F., sequel of Case 37, operated on in 1891, when gall-stones were crushed in the common duct. She made a good recovery from the operation, and was well for some time ; but in 1896 the symptoms recurred, associated with jaundice, due probably to the fragments that had been left. Her attacks of pain were associated with an intensification of the jaundice, and with frequent ague-like seizures pointing to suppurative cholangitis, and a further operation was performed.

*Operation.*—23/7/1900. Adhesions were most extensive, and occupied a long time in detaching. The cystic and common ducts were each thickened, and contained fragments of gall-stones and purulent bile. The head of the pancreas was hard and pressing on the duct. Duodeno-choledochotomy was performed, the wound being afterwards sutured with catgut. Although she suffered from shock for a few hours after the operation, yet she rallied well and appeared to be going on satisfactorily. At the end of a week a duodenal fistula developed, which rendered feeding extremely difficult, and led to death from exhaustion a week later.

*Gall-stones, Tumour of Head of Pancreas, Chronic Pancreatitis : Cholecystotomy.*

CASE 289.—Mrs. R., aged forty-two, seen with Dr. Rayner, Stockport. Spasms fifteen years, much worse lately ; for the last three years accompanied by jaundice ; latterly the jaundice had been persistent ; a rigor with the last attack ; no ascites ; no œdema of the legs ; gall-bladder not enlarged ; no nodules on the liver ; patient very feeble ; pulse 120.

*Operation.*—18/11/1899. Cholecystotomy ; adhesion of the gall-bladder to the liver, stomach, colon, and omentum ; tumour of the head of the pancreas, nodular in character ; a large gall-stone at the junction of the cystic and common duct removed through the gall-bladder ; many small calculi. At the end of the operation the pulse was 100 ; 10 minims of liq. strychninæ given before operation.

*After-History.*—Good recovery ; January, 1900, patient said to be very well.

*Gall-stones : Cholecystotomy.*

CASE 290.—Mrs. S., aged forty-six, seen with Dr. Woodcock, Leeds. Twenty-three years ago had spasms, then free till three

years ago ; since then frequent gall-stone colic at intervals of one to three weeks. Never deeply jaundiced, but considerable loss of weight ; no tumour ; a slight tinge of jaundice present ; tenderness over the gall-bladder.

*Operation.*—24/11/1899. Cholecystotomy ; eighty gall-stones removed ; numerous adhesions separated.

*After-History.*—Good recovery.

*Gall-stones : Cholecystotomy.*

CASE 291.—Mrs. L., aged sixty-two, seen with Dr. Spink, Otley. Movable tumour in abdomen noticed five years ago ; spasms twenty years ago, not lately ; constipation for years ; no loss of flesh ; no vomiting ; movable smooth tumour to right of and below the umbilicus, free from the kidney, which was normal, but continuous with Riedel's lobe.

*Operation.*—30/11/1899. Cholecystotomy ; single large stone removed from the gall-bladder.

*After-History.*—Good recovery.

*Empyema of Gall bladder bursting into Sac of Umbilical Hernia,  
Gall-stones : Cholecystotomy.*

CASE 292.—Mrs. P., aged seventy, seen with Dr. Shann, York. Seen for what was supposed to be incarcerated hernia becoming strangulated. Fell downstairs eighteen months ago, since which symptoms marked, and it was thought that some fibres of the rectus had been ruptured ; history of spasms with jaundice years ago ; hard tender lump above the umbilicus said to have been partly reducible with a gurgle till twenty-four hours before.

*Operation.*—4/12/1899. Cholecystotomy ; on opening the sac, muco-pus with gall-stones found ; opening enlarged and large calculus removed from the gall-bladder ; drainage.

*After-History.*—Complete recovery ; report, January 2, 1900, to say the patient was quite well.

*Gall-stones : Cholecystotomy.*

CASE 293.—George W., aged sixty-two, seen at the Leeds General Infirmary. For twenty years had had occasional attacks of biliary colic, and six months before admission had a very severe attack, followed by peritonitis. There had been no jaundice and no enlargement of the gall-bladder or liver ; some tenderness at the umbilicus.

*Operation.*—1/12/1899. Cholecystotomy ; 285 gall-stones removed from the gall-bladder and cystic duct.

*After-History.*—Patient was quite well for three weeks, when he was suddenly seized with vomiting, and collapsed the next day. At the autopsy no peritonitis was found, nor anything abnormal in connection with the operation, but two gall-stones had apparently descended from the liver and become impacted in the common duct. These were doubtless the cause of the vomiting and collapse.

*Gall-stone impacted in the Cystic Duct : Choledochotomy and Cholecystotomy.*

CASE 294.—Ellen W., aged forty-nine, seen at the Leeds General Infirmary. Twelve months previously she had a severe attack of biliary colic, followed by peritonitis. The pains had been frequent since, and about six months before admission a swelling was noticed in the abdomen. She had lost weight and was rather feeble. The liver was somewhat enlarged, and below it the gall-bladder could be felt as a nodular swelling. No jaundice.

*Operation.*—7/12/1899. One stone impacted in the cystic duct could not be pushed up into the gall-bladder, and was removed through an incision in the duct; catarrh of the gall-bladder, which was drained.

*After-History.*—Patient made a good recovery.

*Spasms, Catarrhal Cholecystitis, Dilated Stomach : Gastrolysis.*

CASE 295.—Mr. D., aged forty-nine, seen with Dr. McGregor Young, Leeds. Cholecystitis after influenza two years ago; during the past year he had had indigestion and loss of weight; one year ago he weighed 14 stones, now 12 stones. No albumin, no sugar; rigid right rectus simulating tumour; dilatation of the stomach.

*Operation.*—7/12/1899. Separation of adhesions; intimate adhesion between the pylorus and stomach and the liver and gall-bladder; no gall-stones; adhesions separated.

*After-History.*—January 12, 1900, had gained 10 pounds in weight; January 22, gained 4 pounds more.

*Chronic Pancreatitis, Empyema of Gall-bladder, Gall-stones : Cholecystotomy.*

CASE 296.—Mrs. D., aged forty-six, seen with Dr. Berry, Keighley. Spasms for years; acute seizure in July, and three times since; since July pain and sickness every two weeks. No tumour felt at any time; occasionally after an attack slight jaundice; lost 1 stone in weight; never vomited blood; no

melæna; tenderness over gall-bladder; no tumour; slight enlargement of the head of the pancreas.

*Operation.*—11/12/1899. Cholecystotomy; empyema of the gall-bladder; many stones removed from the gall-bladder and cystic duct; adhesions broken down; nodular condition of the head of the pancreas; chronic pancreatitis.

*After-History.*—Good recovery; well, 1901.

*Gall-stones, Empyema of Gall-bladder: Cholecystotomy.*

CASE 297.—Mrs. F., aged fifty-four, seen with Dr. Marsden, Burnley. Cholelithic colic for sixteen years; at first three or four times a year; for last three years constant discomfort, with severe colic every five weeks. No jaundice; lying on the right side easier than the left; tenderness below the right costal margin at the ninth costal cartilage; rigidity of the right rectus; no tumour.

*Operation.*—21/12/1899. Cholecystotomy; gall-bladder acutely inflamed and containing pus; two large stones removed from the cystic duct.

*After-History.*—Complete recovery.

*Gall-stones: Cholecystotomy.*

CASE 298.—Mrs. M., aged forty-four, seen with Dr. Veale, Drighlington. Cholelithiasis four years, with repeated typical attacks requiring morphia to subdue the pain; three attacks within the last fortnight; no jaundice; no tumour, but tenderness over the gall-bladder region.

*Operation.*—21/18/1899. Cholecystotomy; gall-bladder high up under the liver; large stone in the cystic duct pushed back and removed, along with fifty gall-stones from the gall-bladder.

*After-History.*—Complete recovery.

*Gangrene of Gall-Bladder: Cholecystectomy and Cholecystotomy.*

CASE 299.—Mr. A., aged fifty-five, seen with Dr. Tempest Anderson, York. No history of gall-stone colic till the beginning of December, 1899, when severe attack, without jaundice; two minor attacks since; severe seizure a week ago, with rigor and elevated temperature, which had persisted since; no jaundice; very great tenderness over the gall-bladder and the whole of the right hypochondrium; rigid right rectus and questionable distended gall-bladder.

*Operation.*—10/1/1900. Partial cholecystectomy and cholecystotomy; no gall-stones, but very marked local peritonitis; distal

half of the gall-bladder, which was gangrenous, excised ; remnant of cyst drained.

*After-History.*—Complete recovery.

*Gall-stones, Dilated Stomach : Cholecystotomy ; Gastrolysis.*

CASE 300.—Mrs. M., aged sixty-two, seen with Dr. Humphery, Armley. Subject to epigastric and right hypochondriac pain for two years ; worse since an attack of influenza in 1898 ; attacks of pain at times very severe, but never followed by jaundice ; flatulent distension and indigestion, with vomiting at times, and inability to take solid food for six months before operation ; tumour beneath the right costal margin noticed for four months, and tenderness between the umbilicus and ninth costal cartilage ; stomach splash obtained ; bedridden for two months before operation ; great loss of flesh.

*Operation.*—10/1/1900. Cholecystotomy ; adherent pylorus freed ; two large gall-stones removed from the cystic duct, and numerous small calculi from the gall-bladder.

*After-History.*—Complete recovery ; able to take any kind of food, and now putting on flesh ; well, 1902.

*Gall-stones, Dilated Stomach, Adhesions : Cholecystotomy ; Gastrolysis.*

CASE 301.—Miss T., aged thirty-two, seen with Dr. Moffatt, Keighley. Attacks of epigastric pain for four years, occurring at first every three months, but later more frequently ; vomiting and shivering with each attack, but never definite jaundice ; painful seizures have no relation to taking food or exertion. Tenderness over the gall-bladder ; no tumour ; no jaundice ; stomach dilated moderately.

*Operation.*—13/1/1900. Cholecystotomy ; one gall-stone the size of a cherry and 424 small stones removed from the gall-bladder and cystic duct ; pylorus, which was closely adherent to the gall-bladder and duct, freed.

*After-History.*—Good recovery.

*Gall-stones : Cholecystotomy.*

CASE 302.—Mrs. S., aged thirty-five, seen at the infirmary. Severe attacks of cholelithic colic, and many slight attacks during the last five years, each attack followed by more or less jaundice ; eleven years ago slight attacks of spasms with jaundice. Slight tenderness on deep palpation over the gall bladder ; slight jaundice ; no other physical signs.

*Operation.*—13/1/1900. Cholecystotomy ; 229 small stones removed from the gall-bladder and cystic duct, which was dilated.

*After-History.*—Good recovery.

*Gall-stones : Cholecystotomy.*

CASE 303.—Mrs. S., aged fifty-four, seen at the infirmary. For twelve months repeated slight attacks of spasms; during the last three months the attacks had been much more severe. Three weeks ago, after an attack, the patient passed four small gall-stones *per rectum*; following this there was some melæna; distended gall-bladder; no jaundice.

*Operation.*—18/1/1900. Cholecystotomy; two large gall-stones removed from the gall-bladder, one  $\frac{1}{2}$  inch in diameter, and another  $\frac{3}{4}$  inch in diameter.

*After-History.*—Good recovery.

*Gall-stone in Common Duct, Fistula between Gall-bladder and Colon :  
Choledochotomy ; Closure of Fistula.*

CASE 304.—Mr. G., aged fifty, seen with Dr. W. No history of spasms; first attack of gall-stone colic in October, 1897, followed by jaundice; severe seizures in December, 1897, with jaundice lasting two months, and associated with ague-like seizures; slight attacks for a year, and then one very severe in December, 1898, and again in January, 1899. During the whole of the period the icterus deepened after each attack, and occasionally rigors occurred; lost over  $2\frac{1}{2}$  stones in weight; jaundiced, but not deeply; liver not enlarged; no tumour of the gall-bladder; tenderness above and to the right of umbilicus; well-marked dilatation of the stomach.

*Operation.*—28/1/1900. Fistula between shrunken gall-bladder and colon discovered; cystic duct shrunken; common duct dilated to size of small intestine, and containing large floating gall-stone. An incision was continued down the shrunken cystic duct until it reached the dilated common duct; a gall-stone was crushed, and fragments manipulated back through the cystic duct; tube introduced into common duct through cystic duct; fistulous opening into colon closed.

*After-History.*—Uninterrupted recovery.

*Catarrhal Cholecystitis : Cholecystotomy ; Gastrolysis.*

CASE 305.—Mrs. W., aged thirty-eight, seen with Dr. Wallis, Barnsley. For twelve years hepatic colic, but pain rather irregular, passing to the groin as well as to the shoulder; latterly the attacks of pain had recurred every two or three months; patient had never been jaundiced; no physical signs.

*Operation.*—6/2/1900. Cholecystotomy and separation of adhesions; inspissated bile-stained mucus in the gall-bladder; intimate adhesions of the stomach to the liver and gall-bladder; drainage of the cyst and separation of adhesions.

*After-History.*—Good recovery.

*Catarrhal Cholecystitis, Pyloric Adhesions : Cholecystotomy ;  
Gastrolysis.*

CASE 306.—Mrs. M. P., aged thirty, seen with Dr. Rodgers, Burnley. Gall-stone attacks for twelve years; recently more frequent and severe, so that she had been off work for several months; dyspepsia and some loss of flesh; no rigors; no jaundice; no tumour.

*Operation.*—7/2/1900. Cholecystotomy; thick mucus, but no gall-stones; pylorus adherent to the cystic duct, with kinking of the first part of the duodenum; adhesions separated; gall-bladder drained.

*After-History.*—Good recovery.

*Cancer of Pancreas : Cholecystenterostomy.*

CASE 307.—Mr. W., aged fifty-six, seen with Dr. Mercer, Bradford. Fourteen years ago the patient began to suffer from attacks of biliary colic, and five years later three operations were performed by another surgeon and stones removed. He was well up to six months ago, when the pain recurred with chronic jaundice and great loss of flesh and strength.

*Operation.*—7/2/1900. Cholecystenterostomy; Murphy's button used; cancer of the pancreas; no gall-stones found.

*After-History.*—Death ten days after operation from persistent vomiting and exhaustion; no autopsy.

*Catarrhal Cholecystitis, Adhesions : Cholecystotomy ; Gastrolysis.*

CASE 308.—Mr. W., aged forty, seen with Dr. Bradley, Bentham. For six years subject to attacks of pain in the epigastrium, followed by vomiting; lately the attacks more frequent. Discoloration of urine; loss of weight.

*Operation.*—16/2/1900. Cholecystotomy; firm adhesions between pylorus, colon, gall-bladder, and liver separated; no gall-stones found; catarrh of the gall-bladder.

*After-History.*—Good recovery.

*Gall-stones, Cancer of Gall-bladder with Suppuration : Cholecystotomy.*

CASE 309.—Jane A., aged forty-three, seen at the Leeds General Infirmary. For some months the patient had had pain in the upper abdomen; four months ago she had an attack of acute colic, and since then the attacks had come every two or three days, and had been followed by jaundice; shivering attacks had been frequent.

*Operation.*—18/2/1900. Cholecystotomy; the gall-bladder contained pus and gall-stones; it was much thickened, and apparently infiltrated with malignant disease. After the operation a quantity

of pus continued to be discharged from the gall-bladder, and the patient's condition became so much improved that the diagnosis of cancer became doubtful. She returned home with a fistula, but much relieved. (See Case 334.)

*Gall-stones in Common Duct, Jaundice, Infective Cholangitis : Cholecystotomy. Patient too ill for an Extensive Operation.*

CASE 310.—Hannah K., aged fifty-three, admitted to the Leeds General Infirmary, February 20, 1900. Two and a half years ago the patient had had an acute illness with severe abdominal pain, vomiting, constipation, and swelling in the upper part of the abdomen; there was no jaundice. Patient recovered, but had a similar attack six months afterwards, followed by jaundice, which had persisted up to admission; since, she had had minor attacks of pain, and lately the attacks had become more severe, and the jaundice had become more intense; there had been great loss of weight; the liver was enlarged, and the gall-bladder distended and extremely tender.

*Operation.*—2/3/1900. Cholecystotomy; two small stones removed; the common duct was felt to be full of stones, and an attempt to manipulate these back into the gall-bladder was unsuccessful; as the duct was high up under the liver, and the patient's condition extremely bad, choledochotomy was not performed; a large tube was put in the gall-bladder, and the wound was closed in the usual way.

*After-History.*—The patient recovered from the operation, and the wound healed. She appeared to be doing well for a while, but gradually became weaker, and died on March 25 from exhaustion.

*Gall-stones : Cholecystotomy.*

CASE 311.—Alice P., aged forty, admitted to the General Infirmary, March 13, 1900. Ten years ago the patient commenced to have attacks of biliary colic; she had been free from pain for a considerable time up to eighteen months ago, when the attacks recurred with increasing severity, and were followed by jaundice; on one occasion gall-stones were found in the motions. On admission there was no jaundice; no enlargement of the gall-bladder, but considerable tenderness on palpation.

*Operation.*—22/3/1900. Cholecystotomy; one large and several small stones removed from the gall-bladder.

*After-History.*—Patient made a good recovery.

*Gall-stones, Jaundice, Infective Cholangitis : Cholecystotomy.*

CASE 312.—Mrs. F., seen with Dr. Bradbury, Cambridge. For ten years subject to attacks of painful indigestion; five months



ago a severe attack of pain accompanied by jaundice, since which time she had never been free from it; number of small gall-stones had been passed in the motions; great loss of flesh with irregular fever.

*Operation.*—27/3/1900. Cholecystotomy; 607 gall-stones removed, some from cavity in the wall of the cystic duct.

*After-History.*—Good recovery, but convalescence prolonged by some chest trouble; in 1902 some slight recurrence of pain. Well, 1903.

*Gall-stones : Cholecystotomy and Cholelithotripsy.*

CASE 313.—Eliza L., aged thirty-six, admitted to the infirmary March 21, 1900. For eighteen months the patient had been subject to periodical attacks of pain in the right hypochondrium with vomiting and occasional jaundice; constipation had been a marked feature of her illness. These attacks had come at weekly and monthly intervals, and the monthly attacks were usually connected with menstruation, and were more severe than the weekly ones; there had been occasional shivering. The pain was situated in the hepatic area, and occasionally felt below the right shoulder-blade; gall-stones had been found in the motions; no enlargement of the liver or gall-bladder.

*Operation.*—29/3/1900. Gall-bladder distended, inflamed, and surrounded by adhesions; cholecystotomy; several stones with some thick dark bile removed; some stones worked back to the gall-bladder from the common duct; one large stone crushed and scooped out piece-meal.

*After-History.*—Patient made a good recovery.

*Gall-stones, Jaundice, Infective Cholangitis : Choledochotomy.*

CASE 314.—Mary B., aged forty-four, seen at the Leeds General Infirmary. She gave a history of gall-stone attacks of fourteen years' duration and of great failure in health; jaundice was present, and was intensified after each seizure, which was accompanied by a rigor.

*Operation.*—29/3/1900. Choledochotomy for removal of gall-stones from the common duct, and cholecystotomy for drainage.

*After-History.*—Good recovery; the patient was well in 1901.

*Cancer of Liver : Exploratory Operation.*

CASE 315.—Mr. W., aged forty-five, seen with Dr. Reid, Bradford. For some time patient had been subject to attacks of indigestion and abdominal pain, but had never been jaundiced; for the last four months had been losing flesh rapidly, and a tumour was detected in the abdomen.

*Operation.*—18/4/1900. Exploratory laparotomy; malignant disease of the liver.

*After-History.*—Patient recovered from the operation and lived for three months.

*Cancer of the Pancreas: Cholecystotomy.*

CASE 316.—Mrs. T., aged fifty, seen with Dr. Berry, Keighley. Deep jaundice occurring gradually and painlessly; rapid loss of flesh and strength; enlarged liver; dilated gall-bladder.

*Operation.*—23/4/1900. Cholecystotomy; cancer of the head of the pancreas discovered.

*After-History.*—The patient bore the operation well, and for four days was quite satisfactory, when smart hæmorrhage into the gall-bladder occurred, and there was a tendency to oozing from stitch punctures; on the seventh day sudden cerebral hæmorrhage supervened, rapidly ending in coma.

*Gall-stones, Pyloric Adhesions, Cholecystotomy: Gastrololysis.*

CASE 317.—Mrs. R., aged fifty, seen with Dr. Althorp, Bradford. Twenty years' history of biliary colic, at times followed by yellowness of the conjunctivæ, but never actual jaundice; for the last two years the attacks had been more frequent, and the patient had lost 2 stones in weight; some distension of the gall-bladder and dilatation of the stomach present.

*Operation.*—25/4/1900. Cholecystotomy; nine stones removed from the gall-bladder; firm adhesions to the pylorus separated.

*After-History.*—Good recovery, and the patient gained flesh and remained well for two years afterwards, when there was a recurrence of the symptoms. (See Case 425.)

*Gall-stones in the Common Duct removed by Scoop after Cholecystotomy. Chronic Pancreatitis.*

CASE 318.—Henry L., aged forty-four, seen at the infirmary. Six months previously the patient had an attack of pain in the epigastrium; he had had several attacks since, and three weeks before admission a seizure which was followed by jaundice. Just above the umbilicus a tender median tumour could be felt; no enlargement of the gall-bladder or liver; slight jaundice.

*Operation.*—21/5/1900. Cholecystotomy; 185 small stones removed from the cystic and common ducts by the scoop; some enlargement of the head of the pancreas (chronic pancreatitis); gall-bladder drained.

*After-History.*—Patient made a good recovery.

*Gall-stone in Common Duct, Jaundice and Infective Cholangitis : Cholecystotomy, Choledochotomy.*

CASE 319.—Mr. S., aged fifty-two, seen with Dr. Ellis, Shipley. History of spasms lasting for some years, and in later years there had been jaundice and infective cholangitis ; a gall-stone floating in the common duct.

*Operation.*—7/6/1900. Choledochotomy and cholecystotomy.

*After-History.*—Good recovery ; the patient was well in July, 1901.

*Catarrhal Cholecystitis, Adhesions : Cholecystotomy.*

CASE 320.—George H., aged forty-nine, admitted to the infirmary, May 31, 1900. Four years ago was said to have had influenza, which was followed by abdominal pain ; since then he had had frequent attacks of severe pain in the right side radiating round to the back and up into the neck. Had never been jaundiced ; there had been some loss of flesh ; some tenderness in the right hypochondrium ; no enlargement of the liver or gall-bladder.

*Operation.*—7/6/1900. Gall-bladder thickened and adherent, containing mucus, but no stones. Adhesions separated and gall-bladder drained.

*After-History.*—The patient made a good recovery and remained well.

*Gall-stones, Cholecystitis, Abscess : Cholecystotomy ; Drainage ; Gastrolysis.*

CASE 321.—Mrs. L., aged thirty, seen with Dr. Hopkins, Leeds. Two years ago the patient had had symptoms of gastric ulcer, and on one occasion had had violent hæmatemesis ; three months ago had a violent attack of pain followed by jaundice and distension of the gall-bladder ; second attack six weeks ago, since which time there had been considerable fever, and the patient had lost flesh, and was very ill. Stomach dilated.

*Operation.*—8/6/1900. Cholecystotomy ; an abscess was found between the gall-bladder, stomach, and liver, containing gall-stones ; twelve stones were found in the gall-bladder, cystic, and common ducts ; these were removed through an incision in the gall-bladder. Pyloric adhesions separated.

*After-History.*—Good though slow recovery. Remained well for a year, when had recurrence of pain. (See Case 395.)

*Catarrhal Cholecystitis, Adhesions : Gastrolysis.*

CASE 322.—Charlotte H., aged forty-nine, admitted to the General Infirmary, June 4, 1900. At fourteen years of age the patient had an attack of jaundice ; for the last few years had suffered from attacks of biliary colic, accompanied by vomiting

and jaundice; the last four or five attacks had been very severe. No enlargement of the liver or gall-bladder; some tenderness on deep pressure; stomach dilated.

*Operation.*—12/6/1900. Gall-bladder shrunken and adherent; no stones palpable in gall-bladder or ducts; adhesions broken down; abdomen closed.

*After-History.*—The patient made a good recovery.

*Gall-stones, Jaundice, Suppurative Cholangitis, Empyema of Gall-bladder : Cholecystotomy.*

CASE 323.—John R., aged forty-seven, admitted to the General Infirmary, June 9, 1900. For twenty years had suffered from attacks of biliary colic; five weeks ago had a very severe attack, followed by jaundice, which had persisted up to the present time; vomiting had been persistent during the last week; patient had lost considerable flesh, and was deeply jaundiced; to the right of the epigastrium a hard, rounded mass could be felt below the liver, the edge of which could be felt over it during inspiration. While in the hospital the jaundice became deeper, and his temperature was above 100° F. every evening.

*Operation.*—21/6/1900. Incision over the swelling; after dividing the muscles, a mass of inflammatory disease was cut into, and some pus met with. On deepening the incision, the gall-bladder was found to be full of pus and gall-stones; these were removed. The incision was prolonged downward; the peritoneum was opened, and the ducts explored with the fingers. Stones were felt in the common duct; these were pushed up through the dilated cystic duct into the gall-bladder and extracted. The wall of the gall-bladder could not be clearly defined, as there was a considerable hard, nodular mass which felt like malignant growth. A large tube was inserted into the gall-bladder; the rest of the wound was closed in the ordinary way.

*After-History.*—The patient recovered fairly well from the operation, but did not make much headway; the jaundice became more intense, and the patient went home at his own request on July 11, 1900.

*Gall-stones : Cholecystotomy; Cholelithotrixy; Gastrolisis.*

CASE 324.—Edith M., aged forty-four, admitted to the General Infirmary, June 12, 1900. Ten years ago the patient commenced to have pain in the right side of the epigastrium, which was aggravated by taking food; this trouble subsided at the end of six months; lately she had had occasional severe attacks of pain after food, commencing beneath the right costal margin, radiating to the back; there had been no jaundice; patient had only vomited

on one occasion. Bimanual examination revealed slight dilatation of the stomach.

*Operation.*—28/6/1900. An incision was made over the gall-bladder, which was found to contain gall-stones; cholecystotomy; five large stones removed from the gall-bladder; one impacted in the cystic duct was crushed, and the fragments extracted with a scoop; gall-bladder drained; gastrolysis for separation of pyloric adhesions.

*After-History.*—Patient made a good recovery.

*Catarrhal Cholecystitis, Adhesions: Cholecystotomy; Gastrolysis.*

CASE 325.—Mrs. S., aged forty-two, seen with Dr. Schollick, Guildford. Twenty years' history of attacks of biliary colic; no jaundice or rigors; stomach symptoms with 'spasms.'

*Operation.*—11/7/1900. Cholecystotomy; no gall-stones found; adhesions of the gall-bladder and cystic duct to the duodenum, pylorus and omentum producing kinking of the cystic duct; adhesions separated.

*After-History.*—Good recovery.

*Biliary Fistula closed by Plastic Operation.*

CASE 326.—Kate F., aged thirty-one, seen at the Leeds General Infirmary. Eight months previously the patient was operated on by another surgeon for gall-stones; a biliary fistula persisted.

*Operation.*—19/7/1900. Plastic operation and closure of the fistula; ducts explored; no cause for obstruction found; opening in the gall-bladder closed by sutures.

*After-History.*—Patient made a good recovery, and remains well.

*Cancer of the Pancreas: Cholecystotomy.*

CASE 327.—Mrs. H., aged sixty-five, seen with Dr. Horne, Scarborough. Two years ago patient had some enlarged glands removed from the groin, which were thought to be sarcomatous; six weeks ago jaundice came on suddenly, accompanied by pain; some enlargement of the liver and distension of the gall-bladder, with a tumour of the pancreas.

*Operation.*—22/7/1900. Cholecystotomy; malignant disease of the head of the pancreas.

*After-History.*—Patient made a good recovery from the operation, and lived for some months.

*Acute Cholecystitis during Course of Typhoid Fever, Repeated Rigors, Delirium, High Temperature.*

CASE 328.—Mr. G., aged fifty, seen with Dr. Herbert J. Robson, Leeds. Swelling of the gall-bladder; enlarged cirrhotic liver and

some ascites ; high fever and delirium had been present for three weeks.

*Operation.*—24/7/1900. Gall-bladder acutely inflamed and containing pus ; drainage.

*After-History.*—Patient in delirium dragged the tube out at the end of twenty-four hours ; five days later it was re-inserted, as drainage was defective. The patient continued delirious and unaltered in his general condition for about a fortnight, when he succumbed to typhoid symptoms, but without any sign of peritonitis.

*Gall-stones in Common Duct : Duodeno-choledochotomy ; Cholecystotomy.*

CASE 329.—Miss W., aged twenty-eight, seen with Dr. Graham, Cockermouth. For some time the patient had suffered from indigestion, and for the last six months had had more or less continuous pain over the gall-bladder ; three months ago had a violent attack of biliary colic, followed by jaundice, which partly disappeared in a few days ; since then the attacks had been frequent, and always followed by jaundice ; loss of flesh.

*Operation.*—24/7/1900. Duodeno-choledochotomy and cholecystotomy ; catarrh of the gall-bladder ; two stones impacted at the ampulla of Vater.

*After-History.*—Good recovery. Well, October, 1903.

*Cancer of Gall-bladder, Liver, and Pylorus, Gall-stones : Cholecystectomy ; Hepatectomy and Pylorectomy.*

CASE 330.—Mrs. S., aged sixty-three, seen with Dr. Fry, Oakworth. (See p. 190.) Patient well, 1903.

*Gall-stones, Jaundice, and Infective Cholangitis : Choledochotomy ; Cholecystotomy.*

CASE 331.—Mrs. S., aged fifty-four. Two years previously the patient had an attack of biliary colic, followed by jaundice ; there had been several severe attacks since, with ague-like seizures and loss of weight.

*Operation.*—22/8/1900. Choledochotomy and cholecystotomy ; five stones removed from the common duct.

*After-History.*—Good recovery ; the patient was well in June, 1903.

*Gall-stone in Common Duct, Jaundice, Infective Cholangitis : Choledochotomy ; Cholecystotomy.*

CASE 332.—Mr. H., aged fifty-six, seen with Dr. Barrs, Leeds. For twenty-five years patient had been troubled with diarrhoea and indigestion ; the first attack of gall-stone colic and jaundice occurred six months previously.

*Operation.*—22/8/1900. Choledochotomy and cholecystotomy; one stone was ulcerating through the gall-bladder, and one was in the common duct; there was muco-pus in the ducts; suppurative cholangitis was present; posterior drainage was employed. Recovery was tardy but satisfactory.

*After-History.*—The patient has been well since, except for occasional attacks of pain, probably due to catarrh.

*Jaundice, Biliary Fistula: Exploratory Operation.*

CASE 333—Miss B., seen in Shropshire. Operation by a surgeon in London, Christmas, 1899, when gall-stones were removed. Some relief was given for a time, but the jaundice never cleared up, and had recently become more intense; moreover, there was a biliary fistula, with very imperfect drainage.

*Operation.*—1/9/1900. Adhesions almost insuperable, and with great difficulty the ducts were exposed; no gall-stones felt; gall-bladder and ducts shrunken, probably strictured; hepatic duct on surface of liver opened on separating adhesions: this laceration poured out bile very freely, much more so than the biliary fistula; abdomen closed around a drain.

*After-History.*—Unfortunately, on account of pain, morphia was administered on the evening of operation and subsequently (contrary to my usual custom); this was followed by distension of the abdomen and difficulty in breathing; bile flowed freely from the liver, but very little from the tube; death occurred on the third day.

*Cancer of Gall-bladder and Colon: Cholecystectomy, Colectomy, and Hepatectomy.*

CASE 334.—Jane A., aged forty-three (see Case 309). After the previous operation, in February, a good many concretions came away through the fistula. On re-admission, there was a free discharge of muco-pus, and a hard mass could be felt below the fistula.

*Operation.*—13/9/1900. Gall-bladder was much enlarged and infiltrated with hard growth, which was invading the liver close to the gall-bladder, as well as the hepatic flexure of the colon; about 6 inches of colon were removed, and the extremities were united by a Murphy's button; the cystic duct and the border of the liver were transfixed with a pin, and a rubber ligature applied below the pin, which was brought out of the wound, the gall-bladder and affected portion of liver being then amputated.

*After-History.*—The patient rallied well from the operation, and, as the whole of the disease had apparently been removed, good

hopes of recovery were entertained, but on the second day the heart began to fail, and death occurred from exhaustion.

*Gall-stones : Cholecystotomy.*

CASE 335.—Martha Crowther, aged forty-five, admitted to the General Infirmary, September 10, 1900. Five years' history of biliary colic, but no jaundice; recently the attacks had become more frequent and more severe; gall-stones had been found in the motions; no enlargement of the liver or gall-bladder; some tenderness on deep pressure.

*Operation.*—14/9/1900. Cholecystotomy; forty faceted gall-stones removed; tube secured into gall-bladder by a purse-string suture.

*After-History.*—Patient made a good recovery.

*Gall-stones : Cholecystotomy.*

CASE 336.—Mrs. S., aged fifty-four, seen with Dr. Hawthorn, Sheffield. For fifteen years the patient had suffered from attacks of biliary colic, which were always followed by jaundice; there had been some loss of flesh, but no rigors; some enlargement of the right lobe of the liver; no distension of the gall-bladder; marked tenderness above the umbilicus.

*Operation.*—23/9/1900. Cholecystotomy; one gall-stone removed from the gall-bladder, one impacted in the cystic duct was crushed and removed with the scoop; adhesions between the gall-bladder and duodenum separated.

*After-History.*—Good recovery; well, July, 1903.

*Gall-stones, Empyema of Gall-bladder : Cholecystotomy.*

CASE 337.—John T. B., aged thirty-six, admitted to the General Infirmary, September 21, 1900. Eighteen months' history of severe biliary colic, always followed by jaundice, which cleared up in two or three days. Patient was in good condition, and there was no jaundice; no tenderness.

*Operation.*—27/9/1900. Gall-bladder found to be small and retracted far up under the liver. It could not be brought near to the surface. Gall-bladder was incised, and two large and several small stones, together with some pus, removed from it. Owing to the impossibility of bringing the gall-bladder to the surface, and the difficulty of fastening in a tube, the opening in the gall-bladder was sutured, some gauze packing arranged around it, and a drainage-tube passed into the right kidney-pouch.

*After-History.*—The patient made a good recovery.



*Gall-stones : Cholecystotomy.*

CASE 338.—Mrs. F., aged thirty-five, seen with Dr. Mackenzie, Douglas. For five years the patient had been subject to attacks of biliary colic; for a month had had continuous pain, with enlargement of the gall-bladder.

*Operation.*—4/10/1900. Cholecystotomy; two stones removed from the gall-bladder, and one from the cystic duct.

*After-History.*—Good recovery. Wound healed by first intention, but some time afterwards a slight mucous fistula developed.

*Gall-stones : Cholecystotomy.*

CASE 339.—Samuel M., aged forty-two, admitted to the infirmary, September 27, 1900. For two years a history of severe attacks of abdominal pain, always followed by jaundice; gall-stones had been found in the motions on several occasions; no enlargement of the liver or gall-bladder; some tenderness present.

*Operation.*—4/10/1900. Gall-bladder involved in adhesions, shrunk, and retracted beneath the edge of the liver; cholecystotomy; two small stones extracted piecemeal with a scoop; as the gall-bladder could not be brought up to the surface, it was closed by a double layer of catgut sutures and a drain passed down to the sutured incision.

*After-History.*—The patient made a good recovery.

*Cholelithiasis : Cholecystectomy ; Partial Hepatectomy.*

CASE 340.—Emma L., aged forty-two, seen at the Leeds General Infirmary. (See p. 170.)

*Cholecystitis : Cholecystotomy.*

CASE 341.—Mrs. W., aged thirty-six, seen with Dr. Liddell, Harrogate. Had had cholecystotomy for gall-stones, November 25, 1897, and had been well for over two years, when she began to have attacks of abdominal pain; during the last few weeks the pain had been constant and accompanied by slight jaundice. The gall-bladder was distended and tender, and the right kidney was freely movable.

*Operation.*—25/10/1900. Gall-bladder distended with muco-pus; duct thickened and ulcerated; cholecystotomy; drainage continued for some considerable time.

*After-History.*—Ultimately got quite well. Well, 1902.

*Gall-stones in Common Duct, Jaundice, Infective Cholangitis : Choledochotomy.*

CASE 342.—Mrs. D., aged forty-three, seen with Dr. Davies, Newport. She had suffered from biliary colic for six years, and from jaundice for two months; two recent colicky attacks had been followed by fever and rigors; there were jaundice and infective cholangitis.

*Operation.*—26/10/1900. Choledochotomy; one rough stone removed from the common duct; anterior drainage was adopted. After a severe attack on July 19, 1901, another gall-stone was passed.

*After-History.*—The patient was well in November, 1901.

*Chronic Pancreatitis with Abscess associated with Gall-stones: Cholecystotomy; Relief; Death Four Months later from Exhaustion; Necropsy.*

CASE 343.—Mr. H., aged forty, was seen by me with Dr. Woods, of Batley, on October 11, 1900.

*Condition when First Seen.*—The patient was then deeply jaundiced and extremely ill, suffering from continuous fever, with exacerbations, great debility, and extreme emaciation. A large tumour in the region of the pancreas could then be felt, as well as a distended gall-bladder.

*History.*—He had been failing in health for nine months, and gave a history of gall-stone attacks and painful indigestion for some time before that, but, although he had had frequent attacks of abdominal pain for three or four months, the jaundice had only supervened a fortnight before my seeing him.

*Operation.*—He was too ill to bear a prolonged search, and there were numerous adhesions around the tumour, which was made out to be a swelling of the pancreas; the gall-bladder was simply opened and drained of a quantity of muco-pus. A quantity of pus was discharged from the drainage-tube several days after operation, and this was repeated on two or three occasions, as if it came from a deeply-seated abscess. A large drainage-tube having been used, there was a free discharge of bile, and a considerable number of gall-stones were evacuated through it—thirty-three in all.

*After-History.*—Previous to the operation the patient was suffering from shivering attacks and a persistently elevated temperature, which subsided immediately after drainage was effected, and the temperature kept nearly normal throughout the remainder of his illness, it being normal in the morning, though there was usually a hectic rise each evening. He made slow though apparently steady recovery from the operation, and the pancreatic tumour diminished so rapidly that it was confidently believed to be entirely disappearing, it being only one-third as large as at the time of operation. He returned home on December 14, but he never really picked up strength, and, though there was no further elevation of temperature, he gradually got weaker, and died in February.

*Necropsy.*—At the post-mortem examination made by Dr. Woods, a tumour of the pancreas was discovered which was carefully

examined by Mr. Cammidge and pronounced to be a chronic inflammatory tumour, and not new growth, the centre being occupied by pulpy material where the abscess had originally been. Nothing else was discovered, and there were no gall-stones left either in the gall-bladder or ducts.

*Gall-stones, Tumour of Liver : Cholecystotomy ; Hepatectomy.*

CASE 344.—William W., aged forty-one, admitted to the General Infirmary, November 19, 1900. Eighteen months ago had the first attack of biliary colic, which was accompanied by vomiting and followed by jaundice, which had persisted for five or six weeks, during which time he had had recurring attacks of pain and vomiting; had had similar attacks since; three months ago had a very severe attack of pain followed by jaundice, which persisted for two months; had lost 3 stones in weight. On admission there was no jaundice.

*Operation.*—29/11/1900. Gall-bladder enlarged and distended; three gall-stones removed; gall-bladder drained. A small pedunculated growth removed from the margin of the liver.

*After-History.*—Patient made a good recovery.

*Cancer of the Cystic Duct, with Gall-stones : Cholecystotomy.*

CASE 345.—John B., aged fifty-seven, seen at the Leeds General Infirmary. Patient had been well up to twelve months before admission, when he began to suffer from painful dyspepsia. Three months previous to admission the pain became more severe, but there was no jaundice; there had been frequent vomiting, and the patient had lost weight and strength, and looked cachectic; a slight icteric tinge in the conjunctivæ could be seen, and a hard mass could be felt in the right hypochondrium.

*Operation.*—29/11/1900. Cholecystotomy; 500 small stones removed from the gall-bladder, and one about the size of a pigeon's egg, through an incision in the cystic duct; the cystic duct was infiltrated with new growth.

*After-History.*—The patient died on the second day from shock.

*Ulceration and Perforation of Bile-ducts, Peritonitis : Drainage.*

CASE 346.—Mrs. T., aged sixty, seen with Dr. Crawford Watson, Harrogate, suffering from peritonitis, with distension of the abdomen and partial obstruction of the bowel; clear history of gall-stones for several years, and of sudden pain on the right of the abdomen a week previous to my seeing her. There was an old umbilical hernia. A fluid wave felt on the right side of the abdomen before operation.

*Operation.*—6/12/1900. Laparotomy; large collection of pus and

bile discovered on the right of the abdomen, due to perforation of the bile-ducts, the exact site of which could not be made out on account of the extensive adhesions; bowels tied down by adhesions extending from the umbilical hernia; general paralytic distension of intestine due to peritonitis; separation of adhesions; drainage of the infected area; free purging by calomel.

*After-History.*—Patient much relieved at first, and for three days promised to do well; pneumonia developed on the fourth day and proved fatal on the sixth.

*Gall-stones : Cholecystotomy.*

CASE 347.—Annie J., aged thirty-two, admitted to the General Infirmary, November 22, 1900. For six years had had occasional abdominal pain; recently the attacks had occurred every day; the pain had been very severe, starting in the right hypochondrium, and running to the back and the right shoulder; jaundice occurred about a week before, and lasted four or five days; a thickened mass was felt in the epigastrium, the right hypochondrium, and in the region of the gall-bladder, which was tender on pressure.

*Operation.*—6/12/1900. Cholecystotomy; forty stones removed from the gall-bladder.

*After-History.*—The patient made a good recovery.

*Gall-stones, Dilated Stomach : Cholecystotomy ; Gastrolysis.*

CASE 348.—Annie W., aged thirty-eight, admitted to the General Infirmary, December 19, 1900. For two years had had attacks of pain in the right side of the abdomen which had become more frequent during the last two months; lately the attacks had been followed by jaundice. The patient complained very much of flatulence and distension of the abdomen after food; stomach considerably dilated, extending  $1\frac{1}{2}$  inches below the umbilicus; no tumour to be detected.

*Operation.*—3/1/1901. Cholecystotomy: twelve stones removed from the gall-bladder; extensive adhesions between the gall-bladder, omentum, pylorus, and colon; stomach much dilated; gastrolysis.

*After-History.*—Good recovery.

*Gall-stones : Cholecystotomy.*

CASE 349.—Mr. T., aged fifty-one, seen with Dr. Knight, Rotherham. Fifteen years ago had several attacks of biliary colic with considerable loss of flesh; was free from attacks for some years; some months ago the attacks recurred and were followed by jaundice, and several stones were passed.

*Operation.*—4/1/1901. Cholecystotomy; gall-bladder contracted and contained several gall-stones; one large stone removed from the cystic duct.

*After-History.*—Patient made a good recovery.

*Gall-stones : Cholecystotomy.*

CASE 350.—Mary Jane F., aged twenty-seven, admitted to the General Infirmary, January 8, 1901. For six months frequent attacks of biliary colic with vomiting and loss of flesh.

*Operation.*—17/1/1901. Cholecystotomy; five gall-stones removed from the gall-bladder.

*After-History.*—Good recovery.

*Gall-stones, Empyema of Gall-bladder : Cholecystotomy.*

CASE 351.—Mr. G., aged forty-five, seen with Dr. Mercer, Bradford. During the last few months patient had had several attacks of biliary colic, and had been slightly jaundiced on several occasions; had lost 40 pounds in weight, and had become very anæmic; gall-bladder enlarged and tender.

*Operation.*—17/1/1901. Cholecystotomy; empyema of the gall-bladder; one stone removed from the cystic duct; the gall-bladder could not be brought to the surface.

*After-History.*—Good recovery.

*Gall-stones in Common Duct : Choledochotomy and Cholecystotomy.*

CASE 352.—Elizabeth H., aged forty-five, seen at the General Infirmary. Had had colic for eight years; jaundice was present, and was increased after each attack.

*Operation.*—21/1/1901. Choledochotomy and cholecystotomy; several gall-stones were removed from the gall-bladder and the common duct, and a good recovery followed.

*Gall-stones : Cholecystotomy.*

CASE 353.—Lavinia M., aged thirty-six, admitted to the General Infirmary, January 5, 1901. Twelve weeks ago had had an attack of pain in the right hypochondrium, passing through to the back, followed by jaundice in a few hours; since then the attacks had been frequent and always followed by persistent jaundice; considerable tenderness over gall-bladder; no enlargement of the gall-bladder or liver.

*Operation.*—24/1/1901. Cholecystotomy; nine stones removed from the gall-bladder.

*After-History.*—Good recovery.

*Large Gall-stone in Common Duct : Chronic Pancreatitis ; Duodeno-choledochotomy ; Subsequent Hæmorrhage controlled by Chloride of Calcium.*

CASE 354.—M. E. G., a married woman, aged thirty-eight years, was admitted to the Leeds General Infirmary on January 23, 1901. She had had typhoid fever in September, 1899, and had never been quite well since. Shortly afterwards she began to suffer from biliary colic, though she had never been jaundiced till six months before admission, from which time jaundice had never left her. On December 24, 1900, she became much worse, and had very severe paroxysmal pain, accompanied by shivering and profuse sweats. From that time she lost weight very rapidly, and the jaundice deepened. On admission, the liver could be felt below the ribs, and there was a distinct fulness on deep palpation in the region of the pancreas. From January 21 to 31 she took calcium chloride in 20-grain doses thrice daily. Duodeno-choledochotomy was performed on January 31. There was very little bleeding. A stone nearly as large as a pigeon's egg was removed from the ampulla of Vater, which was laid open over a director introduced through the papilla at its opening into the duodenum. The head of the pancreas was felt to be much enlarged and hard. The incision into the ampulla was not sutured, and through it the common bile-duct, very much dilated, was explored by the finger. The anterior wound in the duodenum was then sutured, and the abdominal wound was closed. A drainage-tube was inserted through a stab wound in the right loin. The patient inadvertently did not have calcium chloride given in the nutrient enemata, as is usual in these cases. She did well till the morning of February 2, when the nurse noticed at three o'clock that the dressings were soaked with bright blood. The drainage wound was exposed, but no hæmorrhage was occurring there. On examining the abdominal incision, blood was seen to be slowly oozing from it and from the stitch punctures. One drachm of calcium chloride was administered at once by the mouth, and three stitches were removed ; the surface of the wound was then seen to be oozing all over. It was packed with gauze soaked in tincture of hamamelis, and a firm dressing was applied. One drachm of calcium chloride was given again in two hours, and afterwards it was repeated in 30-grain doses every two hours for six times, the drug being then given thrice daily. There was no recurrence of hæmorrhage, and the patient made an uninterrupted recovery. The drainage-tube was removed on the 4th, and she returned home within the month. An examination of the blood showed a very marked diminution in the blood-plates. Well when heard of some months later.

*Catarrh of Gall-bladder : Cholecystotomy ; Gastrolysis.*

CASE 355.—Mr. M., seen with Dr. Tilley, London. Four years ago the patient had biliary colic, followed by jaundice ; since then he had been subject to attacks of pain in the abdomen ; no vomiting, but loss of flesh ; the gall-bladder is said to have been enlarged during several of the attacks, and was very tender ; some dilatation of the stomach.

*Operation.*—31/1/1901. Cholecystotomy ; gall-bladder small and contracted, and firmly adherent to the pylorus ; no gall-stones present.

*After-History.*—Good recovery from operation, but had further trouble with the dilated stomach, which was treated by rest and general massage. Well, 1903.

*Chronic Pancreatitis : Cholecystotomy.*

CASE 356.—Robert H., aged twenty-six, seen at the Leeds General Infirmary. Patient was deeply jaundiced, and had had jaundice since the age of seventeen, it having supervened upon a severe attack of what appeared to be biliary colic, of which he had had several seizures since the age of fourteen. For two or three years he had had several ague-like attacks, and during that time he lost very seriously in weight and strength ; but during the past two years there had been no shivers, and he had also been free from the severe paroxysms of pain, though he had had slighter seizures, after all of which the jaundice became more intense. The patient was then only weighing 9 stones, and all the bile was apparently passing into the urine and none by the bowels ; there was some swelling in the region of the pancreas, slight enlargement of the liver, and a very decided enlargement of the spleen. Fine pancreatic crystals found.

*Operation.*—31/1/1901. Cholecystotomy ; the gall-bladder was contracted and adherent ; the head of the pancreas was found to be enlarged and very hard ; no gall-stones. The gall-bladder was drained. For a few days the jaundice was deeper ; it then became gradually less until it almost disappeared. In ten days the stools became bile-stained, and have since retained their colour, though there has never been complete freedom from a tinge of jaundice in the skin.

*After-History.*—He returned home on April 16, having gained nearly  $\frac{1}{2}$  stone in weight. For subsequent history, see Case 397.

*Gall-stones in Common Duct, Gall-bladder-Duodenal Fistula : Cholecystotomy and Cholecystotomy ; Repair of Fistula ; Gastrolysis.*

CASE 357.—Mrs. C., aged fifty, seen with Dr. H. Mitchell, Cockermouth. She had suffered from attacks of colic over a long period of time ; jaundice was moderate.

*Operation.*—6/2/1901. Choledochotomy and cholecystotomy; two stones removed from the gall-bladder and one from the common duct; there was a fistula between the gall-bladder and the duodenum, which was repaired. Pyloric adhesions separated.

*After-History.*—Complete recovery followed, and the patient was well in September, 1903.

*Cancer of Pancreas : Cholecystotomy.*

CASE 358.—Mr. S., aged sixty-five, seen with Dr. Russell, Brigg. Six months before, the patient had a severe attack of abdominal pain, followed by slight jaundice; two weeks ago had another attack of pain, followed by jaundice, which persisted; there had been considerable loss of flesh; slight enlargement of the liver, but no definite enlargement of either the gall-bladder or pancreas could be felt, and there was no marked tenderness.

*Operation.*—14/2/1901. Cholecystotomy; malignant disease of the head of the pancreas; no gall-stones found.

*After-History.*—Patient died from post-operative hæmatemesis thirty hours after operation.

*Gall-stones : Cholecystotomy.*

CASE 359.—Sarah N., aged fifty-nine, admitted to the General Infirmary, February 11, 1901. For six weeks had had very severe attacks of pain in the right hypochondriac region, followed by jaundice and loss of flesh; no enlargement of the gall-bladder, but considerable tenderness.

*Operation.*—15/2/1901. Cholecystotomy; thirty stones removed from the gall-bladder.

*After-History.*—Good recovery.

*Infective Cholangitis, Gall-bladder-Duodenal Fistula, Jaundice : Choledochotomy ; Cholecystotomy ; Ether Bronchitis.*

CASE 360.—John O'C., aged fifty-two years, who was seen at the General Infirmary, had had symptoms for twenty years—'pains, etc.' There were infective cholangitis, with great loss of flesh and strength, and a fistula between the gall-bladder and duodenum; intense adhesions and jaundice.

*Operation.*—Choledochotomy, with closure of the fistula, and cholecystotomy, were carried out on February 15, 1901.

*After-History.*—The patient took ether badly, became livid, and had much mucus in the bronchi. He was never able to clear the lungs, and died from acute congestive bronchitis six hours later.



*Gall-stones, Dilatation of Stomach : Cholecystotomy ; Gastrolysis.*

CASE 361.—Mr. F., aged thirty-four, seen with Dr. Hebblethwaite, Keighley. Thirteen years ago patient had typhoid fever, and soon afterwards began to suffer from pain in the right hypochondrium. He had never been jaundiced, but had suffered from repeated painful attacks, which had become more severe lately, and were associated with loss of flesh ; no enlargement of the gall-bladder, but tenderness below the costal margin ; some dilatation of the stomach.

*Operation.*—12/3/1901. Cholecystotomy ; several stones removed from the gall-bladder, and firm adhesions between the gall-bladder and pylorus separated.

*After-History.*—The patient made a good recovery.

*Cholecystitis with Hypertrophy : Cholecystectomy.*

CASE 362.—Robert A., aged thirty-eight, seen at the Leeds General Infirmary. For three months had many very severe attacks of biliary colic, and on one occasion was deeply jaundiced. Lately he had lost  $1\frac{1}{2}$  stones in weight. No enlargement of the gall-bladder to be felt, but great tenderness present on pressure.

*Operation.*—19/3/1901. Gall-bladder buried in many adhesions, among which was some recent yellow lymph ; these adhesions were separated and the gall-bladder exposed ; in places the walls of the gall-bladder were half an inch thick. Cholecystectomy was performed, the cystic duct being compressed by a clamp, which was removed in seventy-two hours.

*After-History.*—Patient made a good recovery, and remains well.

*Gall-stones, Jaundice : Duodeno-choledochotomy.*

CASE 363.—Hannah S., aged forty-nine, seen at the Leeds General Infirmary. For six years colic had persisted, with varying jaundice.

*Operation.*—22/3/1901. Duodeno-choledochotomy ; eight large and some small stones removed from the common duct.

*After-History.*—Good recovery ; the patient was well some months later.

*Gall-stone : Cholecystotomy ; Gastrolysis.*

CASE 364.—Mrs. K., aged thirty-six, seen with Dr. Mallett, Bolton. Patient had suffered from attacks of pain in the right hypochondrium for fifteen months ; she had never been jaundiced ;

the pain was relieved by vomiting, but did not bear any relation to food. There was a tumour on the right side continuous with an elongated right lobe of the liver. Some dilatation of the stomach and a movable right kidney were present.

*Operation.*—28/3/1901. Cholecystotomy; one stone impacted in the cystic duct removed; gastrolysis.

*After-History.*—The patient made a good recovery, and was well in June, 1903.

*Gall-stones : Cholecystotomy.*

CASE 365.—Ada B., aged thirty-eight, admitted to the General Infirmary, March 27, 1901. For six or seven years had had attacks of pain in the epigastrium. Seven weeks ago she had a very violent attack of pain in the right hypochondrium, accompanied by vomiting and jaundice.

*Operation.*—4/4/1901. Many adhesions around the gall-bladder separated; cholecystotomy; eight stones removed.

*After-History.*—Good recovery.

*Catarrh of Gall-bladder : Cholecystotomy.*

CASE 366.—Mr. A., aged fifty-one, seen with Dr. Metcalf, York. Nine months ago patient began to suffer from vomiting after food, with some considerable pain in the upper part of the abdomen and loss of flesh; recently there had been slight jaundice; gall-bladder enlarged, and stomach somewhat dilated.

*Operation.*—12/4/1901. Cholecystotomy; gall-bladder distended; no gall-stones found; many adhesions.

*After History.*—Patient recovered, and was perfectly well for some time; when heard of early in 1903 he was said to be suffering from growth in the cæcum, but there had been no more gall-stone seizures.

*Cholelithiasis, Carcinoma of the Gall-bladder : Cholecystectomy ; Partial Hepatectomy.*

CASE 367.—Elizabeth H., aged thirty-seven, seen at the Leeds General Infirmary. (See p. 190.)

*Gall-stones : Cholecystotomy.*

CASE 368.—Enoch P., aged twenty-two, admitted to the General Infirmary, April 3, 1901. Up to eighteen months ago was quite well; since then has had monthly attacks of pain below the right costal margin and in the epigastrium; had lost a stone in weight during the last two months, and the attacks were becoming more frequent and more severe; no jaundice; frequent

vomiting; while in the hospital had an attack of pain, followed by profuse vomiting and jaundice.

*Operation.*—18/4/1901. Cholecystotomy; 568 stones removed.

*After-History.*—Good recovery.

*Cancer of the Gall-bladder and Liver : Exploratory Operation.*

CASE 369.—Mary D., aged thirty, admitted to the General Infirmary, April 20, 1901. Two years ago ovariectomy performed; during the last five weeks the patient had suffered from pain in the right hypochondrium, with some cough and difficulty in breathing; pain bore no relation to food; considerable loss of weight.

*Operation.*—23/4/1901. Exploratory; extensive malignant disease of the gall-bladder and liver found.

*After-History.*—Good recovery from the operation; patient returned home.

*Gall-stone, Cancer of Gall-bladder and Liver : Cholecystectomy and Hepatectomy.*

CASE 370.—Mrs. W., aged fifty-six, seen with Dr. Gordon Black, Harrogate. Patient had suffered from pain in the upper abdominal region for some time, but had never suffered from jaundice; during the last few weeks a tumour had appeared in connection with the liver, was associated with severe pain and jaundice.

*Operation.*—30/5/1901. Cholecystectomy and partial hepatectomy; gall-bladder infiltrated with malignant disease, which was spreading to the liver; one large stone in the gall-bladder. The gall-bladder, with a wedge-shaped portion of the liver, removed.

*After-History.*—Patient survived the operation for several weeks, but gradually sank from exhaustion. The jaundice increased, evidently from secondary growth, though no evidence of it at time of operation.

*Gall-stones : Cholecystotomy.*

CASE 371.—Alice H., aged thirty-four, admitted to the General Infirmary, June 4, 1901. For nine years had had attacks of pain in the right side of the abdomen; lately the attacks had been more frequent and severe, accompanied by slight jaundice.

*Operation.*—6/6/1901. Cholecystotomy; twenty small stones removed.

*After-History.*—Good recovery.

*Gall-stones (Cancer of Pylorus) : Cholecystectomy and Pylorotomy.*

CASE 372.—Mr. M., aged fifty-four, seen with Dr. Grimoldby, Grimsby. He was quite well up to four months ago; after a

chill he commenced with stomach symptoms and vomiting; there has been some pain after food, but never severe; no hæmatemesis, no jaundice, and no tumour to be felt; considerable dilatation of the stomach and loss of flesh.

*Operation.*—6/6/1901. Cholecystotomy and pylorotomy; gall-bladder full of gall-stones, with firm adhesions to the pylorus, which formed a distinct tumour (cancer?), and was stenosed; fistula between the gall-bladder and duodenum was found; the gall-stones were removed, the gall-bladder was drained, and the duodenal fistula was closed.

*After-History.*—Some shock for twenty-four hours, then steady improvement, but temperature was never above 97° F. from time of admission until sudden death from heart failure on the eighth day; the abdomen remained flat, and there were no signs of peritonitis.

*Gall-stones : Cholecystotomy.*

CASE 373.—Mr. G., aged forty-four, seen with Dr. Topham, Halifax. For about three years the patient had been subject to attacks of pain over the gall-bladder, passing beneath the right shoulder-blade; the gall-bladder had been noticed to be enlarged after an attack; there had been no shivering and no deep jaundice; no tumour present, but decided tenderness over the gall-bladder.

*Operation.*—7/6/1901. Cholecystotomy; firm adhesions between the gall-bladder, colon, and stomach; thirty-four gall-stones removed from the gall-bladder.

*After-History.*—Good recovery.

*Gall-stone in Common Duct : Choledochotomy and Cholecystotomy.*

CASE 374.—Miss W., aged twenty-nine, seen with Dr. Graham, Cockermouth. Patient was well for some months following the last operation, with the exception of a mucous fistula; recurrence of jaundice and pain took place, accompanied by fever and rigors.

*Operation.*—7/6/1901. Choledochotomy; one round stone removed from the common duct; cholecystotomy for the drainage of the gall-bladder.

*After-History.*—Good recovery. Well, October, 1903.

*Gall-stones in Common Duct, Calcareous Gall-bladder : Choledochotomy ;  
Cholecystectomy.*

CASE 375.—Mrs. W., aged fifty-seven, seen with Dr. Mallett, Bolton. There had been many attacks of biliary colic, and jaundice had been present for three weeks; rapid loss of flesh.

*Operation.*—8/9/1901. Choledochotomy and cholecystectomy; one gall-stone removed from the common duct, and one from the

gall-bladder; the gall-bladder was calcareous, forming a hard tumour.

*After-History.*—The patient made a good recovery, and was very well, June, 1903.

*Gall-stones in Common Duct, Jaundice and Infective Cholangitis :  
Choledochotomy and Cholecystotomy.*

CASE 376.—Mrs. S., aged forty, seen with Dr. F. W. A. Godfrey, Scarborough. For three years she had suffered from colic and jaundice; jaundice and infective cholangitis were present.

*Operation.*—17/6/1901. Choledochotomy and cholecystotomy; eight stones removed from the gall-bladder, and one from the common duct.

*After-History.*—The patient made a good recovery from the operation, and was well in March, 1903.

*Biliary Fistula, Gall stones in Common Duct : Choledochotomy.*

CASE 377.—Mrs. T., aged forty-eight, seen with Dr. T. Wakefield, London. Colic had persisted for one year, and there was jaundice; there was a biliary fistula, the result of a previous operation performed elsewhere in October, 1900, when two stones were found in the cystic duct; slight jaundice and rigors occurred if the fistula was not kept patent.

*Operation.*—1/7/1901. Choledochotomy, with excision of the fistula; two stones were removed from the common duct.

*After-History.*—Good recovery, and the patient is now well (1903).

*Gall-stones, Pericholangitis with Abscess : Cholecystotomy.*

CASE 378.—Mrs. S., aged forty-five, seen with Dr. Latouche, Ossett. Frequent gall-stone attacks up to ten years ago, then free for a period of several years; during the last six months the attacks had been severe, and associated with a distended gall-bladder; patient extremely weak; a fluctuating, tender swelling, occupying the right hypochondrium, could be felt.

*Operation.*—9/7/1901. Cholecystotomy; a large intraperitoneal abscess around the gall-bladder; several stones removed from the gall-bladder, which was drained; the abdomen was also drained separately.

*After-History.*—The patient made a good recovery.

*Actinomycosis of the Gall-bladder : Cholecystotomy.*

CASE 379.—Fred N., aged forty-seven, seen at the Leeds General Infirmary. (See p. 173.)

*Gall-stones in Common Duct, Jaundice and Infective Cholangitis :  
Choledochotomy and Cholecystotomy.*

CASE 380.—Annie F., aged forty-seven, seen at the General Infirmary. For five years she had suffered from colic and jaundice with ague-like seizures; the jaundice was intensified after each attack.

Choledochotomy and cholecystotomy, for the removal of gall-stones, performed on July 19, 1901, resulted in a good recovery, and the patient was well in December.

*Biliary Fistula, Gall-stone in Common Duct : Choledochotomy.*

CASE 381.—Mrs. S., aged thirty, seen with Dr. F. C. Sprawson, Blackpool. Cholecystotomy for gall-stone colic, followed by jaundice, had been performed in February, 1900, elsewhere; there was a biliary fistula with jaundice if the fistula was not kept patent.

*Operation.*—20/7/1901. Choledochotomy and cholecystotomy; one stone removed from the common duct.

*After-History.*—The patient made a good recovery, and was well in November, 1901.

*Gall-stones in Common Duct, Infective Cholangitis, Deep Jaundice, Incessant Vomiting, Heart Disease : Choledochotomy.*

CASE 382.—Mrs. H., aged thirty-eight, seen with Dr. H. J. Robson, Leeds. History of spasms, infective cholangitis and jaundice, extending over some years; high temperature and incessant vomiting for a week before operation. The patient was extremely feeble. There were infective cholangitis, vomiting, heart disease, and deep jaundice.

*Operation.*—21/7/1901. Choledochotomy; several stones removed from the common duct.

*After-History.*—The patient took ether badly, becoming very livid and almost pulseless, and death resulted from shock.

*Cancer of Liver : Exploratory Operation.*

CASE 383.—Mrs. W., aged forty-four, seen with Dr. Jefferies, Bolton. Twenty years' history of gall-stones; remission of symptoms for several years; lately recurrence of pain over the gall-bladder. During the last few weeks a tumour in connection with the liver has been noticed. No jaundice present, but loss of flesh.

*Operation.*—24/7/1901. Exploratory; cancer of the liver found.

*After-History.*—Recovery from operation, and returned home.

*Gall-stones in Common Duct, Deep Jaundice, Chronic Pancreatitis :  
Choledochotomy ; Cholecystotomy.*

CASE 384.—Mr. W., aged forty, seen with Dr. C. H. Taylor, Derby. Patient had had indigestion and pain for a year ; there had been loss of weight and deep jaundice for five weeks. Fine pancreatic crystals found.

*Operation.*—30/7/1901. Choledochotomy and cholecystotomy ; five stones removed from the common duct, and 355 from the gall-bladder ; pancreas enlarged.

*After-History.*—The patient went home with a small tube in the sinus ; he had lost his jaundice and was well in January, 1902.

*Gall-stones in Common Duct, Pyloric Stenosis with Dilatation of the  
Stomach : Choledochotomy ; Cholecystectomy ; Pyloroplasty.*

CASE 385.—Miss T., aged forty-five, seen with Dr. N. Williams, Harrogate. There had been gastric ulcer for two years ; colic and jaundice were present ; there was loss of weight and strength, together with pyloric stenosis and dilatation of the stomach.

*Operation.*—5/8/1901. Choledochotomy, partial cholecystectomy, and pyloroplasty ; twenty gall-stones removed from the gall-bladder, and two from the common duct.

*After-History.*—The patient made a good recovery, and was well in November, 1901, having gained normal weight.

*Gall-stone in Common Duct, Jaundice, Chronic Pancreatitis : Chole-  
dochotomy and Cholecystotomy.*

CASE 386.—Mr. F., aged forty-six, seen with Dr. R. H. Luce, Derby. For four months colic and jaundice had been present, and there was loss of weight ; jaundice very deep indeed. Fine pancreatic crystals found.

*Operation.*—8/8/1901. Choledochotomy and cholecystotomy ; one stone removed from the common duct, and two from the gall-bladder ; head of pancreas swollen from chronic pancreatitis.

*After-History.*—Good recovery ; the patient was well in November, 1901.

*Gall-stones in Common Duct, Cancer of Head of Pancreas : Chole-  
dochotomy ; Cholecystotomy.*

CASE 387.—Mr. M., aged sixty-two, seen with Dr. J. Lawrence, Darlington. For two years colic had persisted, and for a year jaundice had been present ; loss of weight was complained of to the amount of 5 stones ; cholecystenterostomy had been performed previously by another surgeon with temporary improvement ; relapse and recurrence of jaundice, which had continued ; great loss of flesh and strength had taken place. Coarse pancreatic crystals found.

*Operation.*—8/8/1901. Choledochotomy and cholecystotomy; three stones removed from the common duct, and many from the gall-bladder; cancer of the head of the pancreas; anterior drainage adopted.

*After-History.*—The patient was relieved of the pain and jaundice, and returned home within the month; gradual loss of strength, due to cancer of the pancreas, ended in death in October, 1901.

*Gall-stones in Common Duct, Jaundice, and Infective Cholangitis :  
Choledochotomy and Cholecystotomy.*

CASE 388.—Miss M., aged fifty, seen with Dr. J. C. Wilson, Haworth. The patient had had spasms and jaundice for years; there were ague-like attacks, loss of flesh, infective cholangitis and jaundice.

*Operation.*—1/9/1901. Choledochotomy and cholecystotomy; one stone removed from the gall-bladder, and five from the common duct; lumbar drainage was employed.

*After-History.*—Good recovery; the patient was well at the end of 1901.

*Gall-stones : Cholecystotomy.*

CASE 389.—Clara H., aged twenty-seven, admitted to the General Infirmary, August 26, 1901. Sixteen months ago had a severe attack of pain in the epigastrium with vomiting; was quite free from symptoms for six months, when she had another attack, followed by jaundice; the jaundice passed off, but the attacks had recurred almost weekly since, and were more severe; about twenty stones had been passed in the motions.

*Operation.*—5/9/1901. Cholecystotomy; thirteen small-stones removed.

*After-History.*—Good recovery.

*Gall-stones : Cholecystotomy.*

CASE 390.—J. A., aged sixty, admitted to the infirmary, September 2, 1901. He had suffered from attacks of biliary colic for several years; during the last thirteen weeks had had eight severe attacks, all followed by jaundice; loss of flesh lately, amounting to 2 stones; swelling above right costal margin, tenderness above the umbilicus; slight jaundice.

*Operation.*—12/9/1901. Cholecystotomy; two gall-stones removed; drainage.

*After-History.*—Good recovery.

*Cholecystitis and Chronic Catarrh : Cholecystotomy and Nephropexy.*

CASE 391.—Mrs. N., aged thirty-seven, seen with Dr. Clayton, Wakefield. Patient had complained of pain over the right side of



the abdomen, associated with a tumour, for two years ; the attacks were worse during menstruation ; she had never been jaundiced, but had lost weight lately and become anæmic ; tenderness under the right costal margin, and fulness over the gall-bladder region, but no definite tumour ; kidney very mobile.

*Operation.*—24/9/1901. Cholecystotomy and nephropexy ; cholecystitis present, but no gall-stones.

*After-History.*—Patient made a good recovery.

*Catarrhal Cholecystitis with Adhesions, Movable Kidney : Cholecystotomy ; Nephropexy.*

CASE 392.—Susan E., aged forty-two, admitted to the infirmary, September 21, 1901, complaining of continuous aching pain above the right costal margin, and sometimes in the shoulder. No jaundice, but frequently ague-like attacks ; some pain in the right loin ; also tenderness over gall-bladder ; no tumour to be felt ; right kidney movable and tender.

*Operation.*—26/9/1901. Gall-bladder distended and thickened ; adhesions around cystic duct separated ; cholecystotomy ; kidney exposed by lumbar incision ; nephropexy.

*After-History.*—Good recovery.

*Jaundice, Suppurative Cholangitis, General Peritonitis, Phlegmonous Cholecystitis : Drainage.*

CASE 393.—Mrs. A., aged forty-five, seen with Dr. Moore, Holbeck, for general peritonitis, following on cholelithiasis ; jaundice, with phlegmonous cholecystitis and suppurative cholangitis ; patient too ill to bear any extensive operation.

*Operation.*—29/9/1901. Abdomen drained and a quantity of pus and bile evacuated.

*After-History.*—Death the next day from exhaustion due to continuance of the septic symptoms.

*Gall-stones in Common Duct, Jaundice and Infective Cholangitis, Chronic Pancreatitis : Choledochotomy.*

CASE 394.—Mr. B., aged fifty-one, seen with Dr. W. C. D. Hills, of Upwell, Wisbeach. There had been only slight colic, but deep jaundice for a year, and great wasting, with fever, rigors, and other signs of infective cholangitis.

*Operation.*—29/9/1901. Choledochotomy ; five stones removed from the common duct ; the duct was drained, and a lumbar drain was also used ; there was chronic pancreatitis.

*After-History.*—Good recovery ; he had gained 1 stone 3 pounds in weight in November, 1901 ; well, 1903.

*Gall-stone in Common Duct, Jaundice and Infective Cholangitis : Choledochotomy and Cholecystotomy.*

CASE 395.—Mrs. L., aged thirty, seen with Dr. Hopkins, Leeds. Patient was well after the previous operation till three months ago, when she had a recurrence of pain, followed by jaundice, chills, and fever.

*Operation.*—29/9/1901. Cholecystotomy and choledochotomy; one stone removed from the gall-bladder, and one from the common duct.

*After-History.*—Good recovery.

*Gall-stones : Cholecystotomy.*

CASE 396.—Miss T., aged twenty-two, seen with Dr. Williams, Barrow. Three severe attacks of biliary colic during the last six months, and several minor attacks; some loss of flesh and jaundice after the last two attacks; some tenderness over the gall-bladder, but no tumour; movable right kidney.

*Operation.*—30/9/1901. Cholecystotomy; several small stones removed from the gall-bladder and cystic duct.

*After-History.*—Patient made a good recovery, and was well, October, 1903.

*Chronic Pancreatitis, Biliary Fistula : Cholecystenterostomy.*

CASE 397.—Robert H., aged twenty-seven, seen at the Leeds General Infirmary. (See Case 336.) After the previous operation the patient was well for some months, except for slight jaundice, and recently there had been a little discharge of bile from the fistula, which he wished to have cured on account of the inconvenience.

*Operation.*—3/10/1901. Cholecystenterostomy; sinus dissected out and the fundus of the gall-bladder connected to the transverse colon by a Murphy's button.

*After-History.*—Patient made a good recovery from the operation, left the infirmary looking much better, and when heard of later was following his occupation.

*Gall-stone in Common Duct, Jaundice and Infective Cholangitis : Choledochotomy.*

CASE 398.—Charles P., aged fifty-three, seen at the Leeds General Infirmary. Twelve years ago patient had had a first attack of biliary colic; for the two years before admission the attacks had been frequent, and were always followed by jaundice, and rigors; he had lost 6 stones in weight. Jaundice had increased in intensity after each attack; slight enlargement of the liver; no enlargement of the gall-bladder. Pancreatic crystals found.

*Operation.*—10/10/1901. Choledochotomy; one large stone removed from the common duct, which was drained by a tube stitched into the opening; head of pancreas swollen.

*After-History.*—Patient made a good recovery.

*Empyema of Gall-bladder with Abscess of Liver, Gall-stones: Cholecystotomy, Hepatotomy.*

CASE 399.—George S., aged thirty-nine, seen with Dr. Taylor, of Scarborough, October 14, 1901. Attacks of biliary colic for five or six years, always followed by jaundice; loss of weight after each attack; lately the attacks had been more severe.

*Operation.*—15/10/1901. Gall-bladder very adherent to pylorus and colon; cavity in liver communicating with gall-bladder, containing fifty moderate-sized gall-stones and pus; cholecystotomy performed and abscess drained.

*After-History.*—Recovered from operation, but had a biliary fistula; almost all the bile escaped through the fistula, and when it was allowed to close, fever with shivering and vomiting occurred. For subsequent history see Case 418.

*Gall-stone in Common Duct, Cirrhosis of Liver, Ascites, Jaundice, Chronic Pancreatitis: Choledochotomy, Epiploexy.*

CASE 400.—Mr. W., aged fifty eight, seen with Dr. C. S. A. Rigby, Preston. He had had very deep jaundice for three years. Biliary cirrhosis and ascites as well as jaundice were present. Fine pancreatic crystals found.

*Operation.*—21/10/1901. Choledochotomy; one stone removed from the common duct; the omentum was fixed to the anterior abdominal wall; anterior drainage was employed. Pancreas swollen.

*After-History.*—Good recovery; well, June, 1903; no return of ascites.

*Gall-stones: Cholecystotomy.*

CASE 401.—Annie F., aged twenty-nine, admitted to the General Infirmary, October 22, 1901. For two years had occasional attacks of biliary colic; during the last six months the attacks had been more frequent, and were followed by jaundice and some swelling in the region of the gall-bladder. Extreme tenderness over the gall-bladder; no tumour to be detected; no jaundice present.

*Operation.*—24/10/1901. Cholecystotomy; one large, rounded gall-stone removed from the gall-bladder.

*After-History.*—Good recovery.

*Paroxysmal Pains, Adhesions, Catarrhal Cholecystitis : Cholecystotomy ; Gastrolysis.*

CASE 402.—Ada H., aged twenty-two, admitted to the infirmary, October 22, 1901. For five years had suffered from attacks of pain in the right hypochondriac region extending to the back, with occasional vomiting. Had never been jaundiced ; pain bore no relation to food ; stomach dilated.

*Operation.*—24/10/1901. Gall-bladder adherent to pylorus, duodenum, and colon ; adhesions divided ; cholecystotomy.

*After-History.*—Good recovery.

*Gall-stones in Common Duct, Chronic Pancreatitis, Jaundice and Infective Cholangitis : Choledochotomy.*

CASE 403.—Ruth K., aged forty-six, seen at the General Infirmary. There was a history of spasms years before, and for the last eight months there had been very little pain, but the temperature rose from 103° to 105° F. every night. Jaundice and infective cholangitis were present. Fine pancreatic crystals found.

*Operation.*—7/11/1901. Choledochotomy ; the temperature dropped to normal on the day of operation, and remained normal ; swelling of head of pancreas.

*After-History.*—The patient is now well.

*Chronic Catarrhal Cholecystitis : Cholecystotomy.*

CASE 404.—James W., aged thirty-eight, seen at the Leeds General Infirmary. For fifteen years had had occasional attacks of biliary colic ; lately the attacks had become more frequent. There was no jaundice on admission, but the patient stated that he had been jaundiced occasionally.

*Operation.*—21/11/1901. Cholecystotomy for chronic catarrh ; gall-bladder adherent and contracted ; no gall-stones found.

*After-History.*—Patient made a good recovery.

*Gall-stones in Common Duct, Chronic Pancreatitis : Choledochotomy and Cholecystotomy.*

CASE 405.—Miss S., aged fifty-two, seen with Dr. C. Brook, Lincoln. There had been spasms for years and jaundice for four months ; the pancreas was swollen from chronic pancreatitis.

*Operation.*—30/11/1901. Choledochotomy and cholecystotomy ; sixty-five gall-stones removed, including eighteen from the common duct.

*After-History.*—Patient made a good recovery, and remains well.

*Gall-stones in Common Duct, Jaundice, Infective Cholangitis and Chronic Pancreatitis : Choledochotomy and Cholecystotomy.*

CASE 406.—John D., aged forty-eight, seen at the General Infirmary. He was a stout, unhealthy subject, with a history of

former intemperance. He had suffered from gall-stones for twenty years, and from jaundice with infective cholangitis since May, 1901. Crowds of fine pancreatic crystals found.

*Operation.*—7/12/1901. Choledochotomy; 126 gall-stones were removed from the gall-bladder, and 88 from the common and hepatic ducts; head of pancreas swollen.

*After-History.*—Recovery was retarded by bronchitis, but the patient was discharged well in five weeks. Well, 1903.

*Gall-stones : Cholelithotrixy ; Gastrolisis.*

CASE 407.—Alfred C., aged fifty-five, admitted to the General Infirmary, December 1, 1901. Twenty-seven years ago was troubled with attacks of abdominal pain, which were followed and relieved by vomiting. He was free from trouble up to twelve years ago, since when he had had attacks of pain in the abdomen every few months. The pain began in the lower part of the abdomen, then passed into the epigastrium, running through to the back and shoulder, and always accompanied by vomiting, which was copious, but never contained blood; pain bore no relation to food, and patient was never jaundiced; some tenderness in the epigastrium; no enlargement of the gall-bladder; no dilatation of the stomach.

*Operation.*—22/12/1901. Exploratory laparotomy; adhesions between the gall-bladder and stomach divided; liver very cirrhotic; some gall-stones crushed in the gall-bladder.

*After-History.*—Good recovery.

*Chronic Catarrh of Gall-bladder : Cholecystotomy and Gastrolisis.*

CASE 408.—Mrs. B., aged forty-six, seen with Dr. Bates, Ilkley. Attacks of pain over the gall-bladder for three years, with indigestion, flatulence, and pain after food. No tumour of the gall-bladder; no jaundice; some dilatation of the stomach.

*Operation.*—7/1/1902. Cholecystotomy; numerous and firm pyloric adhesions discovered, but no gall-stones.

*After-History.*—Patient made a good recovery from the operation, but has had some digestive disturbance since.

*Catarrhal Cholecystitis, Stricture of Cystic Duct, Adhesions : Cholecystotomy ; Gastrolisis.*

CASE 409.—Mrs. E., seen with Dr. Curd, Bath. Pain resembling gall-stone attacks for many years, with great digestive disturbance; lately the attacks had become so frequent that the patient was leading the life of an invalid. No jaundice and no tumour; some dilatation of the stomach.

*Operation.*—11/1/1902. Cholecystotomy; adhesions between the gall-bladder, pylorus, and liver detached; the gall-bladder

and cystic duct were thickened. No gall-stones present ; pylorus stenosed and kinked. The sequel shows that the cystic duct was strictured, and that cholecystectomy would have been the better operation.

*After-History.*—Patient made a good recovery and the wound healed, but a recurrence of pain necessitated the insertion of a probe and the re-introduction of a small tube, which discharged clear mucus ; the patient otherwise was well, June, 1903.

*Gall-stones in Common Duct, Jaundice and Infective Cholangitis :  
Choledochotomy.*

CASE 410.—Mrs. G., aged forty-four, seen with Dr. Wilson Smith, Bath. (See p. 99.)

*Gall-stones in Common Duct, Jaundice and Infective Cholangitis :  
Choledochotomy.*

CASE 411.—Mr. W., aged sixty-one, seen with Dr. Clampitt, Bootle. (See p. 99.)

*Cholelithiasis, Gangrenous Cholecystitis : Cholecystectomy.*

CASE 412.—Maria T., aged forty-seven, seen at the Leeds General Infirmary. (See p. 119.)

*Cholelithiasis : Cholecystotomy ; Choledochotomy.*

CASE 413.—Mr. T., aged sixty-two, seen with Mr. Templeton, London. Gall-stones in common duct ; choledochotomy.

*After-History.*—Quite well, November, 1903.

*Chronic Pancreatitis, Cholecystitis : Cholecystectomy ; Drainage of  
Hepatic Duct.*

CASE 414.—Eliza T., aged fifty-nine, admitted to the General Infirmary, January 23, 1902. Two and a half years ago had had attacks of abdominal pain, with distension and jaundice ; the jaundice passed off, but similar attacks had frequently occurred. A week before admission she had a severe attack of pain in the upper part of the abdomen, with vomiting, shivering, and jaundice ; tenderness over gall-bladder ; pancreas enlarged and hard. Fine pancreatic crystals found.

*Operation.*—31/1/1902. Small, contracted, and thickened gall-bladder ; head of pancreas enlarged and hard (chronic pancreatitis) ; cholecystectomy ; cystic duct drained.

*After-History.*—Good recovery.

*Gall-stones : Cholecystotomy.*

CASE 415.—Harriet R., aged fifty-four, admitted to the General Infirmary, January 28, 1902. For twelve months had had attacks of biliary colic ; during the last two months the attacks had been

more frequent and severe, and she had been occasionally jaundiced. No enlargement of the gall-bladder ; no jaundice.

*Operation.*—31/1/1902. Cholecystotomy ; 122 stones removed.

*After-History.*—Good recovery.

*Gall-stones in Gall-bladder and Common Duct, Chronic Pancreatitis :  
Choledochotomy and Cholecystotomy.*

CASE 416.—Jane H., aged forty-nine, admitted to the infirmary, January 27, 1902. For twelve months had had attacks of severe pain in the upper part of the abdomen on the left side, passing to the back, and at times accompanied by vomiting and jaundice ; considerable loss of flesh. While in the hospital the patient had a severe attack of biliary colic, with vomiting, shivering, and jaundice. Fine pancreatic crystals found.

*Operation.*—14/2/1902. Small, shrunk gall-bladder found, containing six stones, which were removed by cholecystotomy ; one large stone in the common duct removed by choledochotomy ; incision in the duct sutured ; gall-bladder drained ; pancreas swollen.

*After-History.*—Good recovery.

*Gall-stones in Common Duct : Choledochotomy.*

CASE 417.—Mrs. D., aged forty-four, seen with Dr. Temperley Grey, Lenham. (See p. 99.)

*Imperfect Biliary Fistula, Almost Complete Obliterative Cholecystitis, with  
Complete Stricture of the Common Bile-duct : Exploratory Operation.*

CASE 418.—George S., aged forty, seen at the Leeds General Infirmary. (See Case 399.) Since the previous operation the patient had been in fairly good health, but the fistula was still patent, and large quantities of bile escaped daily. The fistula had a tendency to close, when the patient had pain, with rise of temperature and rigors, until relief was afforded by securing a free flow of the infected bile.

*Operation.*—20/2/1902. Many adhesions found, and the gall-bladder was contracted ; no gall-stones discovered.

*After-History.*—The patient died four days later from intestinal hæmorrhage. At the autopsy the common duct was found to be completely obliterated ; it would not admit a small probe, nor could the papilla be found. The hæmorrhage had occurred from a point in the ileum, within 3 feet of the ileo-cæcal valve, and was apparently not related to the gall-bladder trouble nor to the operation.

*Gall-stone in Ampulla of Vater : Cholecystotomy ; Duodeno-  
choledochotomy.*

CASE 419.—Elizabeth L., aged fifty-nine, admitted to the infirmary, February 19, 1902. Three years attacks of biliary

colic ; last Christmas severe attack, followed by jaundice, clay-coloured motions, loss of flesh, and frequent vomiting ; enlargement and tenderness of gall-bladder ; jaundice present.

*Operation.*—20/2/1902. Bile-ducts distended ; stone impacted at ampulla of Vater removed by duodeno-choledochotomy ; cholecystotomy ; drainage.

*After-History.*—Good recovery ; on December 17, 1902, patient very well, and had regained normal weight.

*Gall-stones with Infective Cholangitis : Cholecystotomy.*

CASE 420.—Mrs. C., aged sixty-five, seen with Dr. Greig, Hampstead. Had suffered from symptoms of gall-stones for years, and recently had had signs of infective cholangitis with slight jaundice. The attacks were at times on the left side, simulating angina pectoris, and being associated with vascular disturbance.

*Operation.*—22/2/1902. Cholecystotomy ; a number of gall-stones were removed from the gall-bladder and ducts.

*After-History.*—Patient made a good recovery, and was able to leave the surgical home shortly after the month-end ; some months subsequently she had several slight attacks, apparently due to catarrh, but they passed off under general treatment.

*Gall-stones, Jaundice, Chronic Pancreatitis : Cholecystotomy and Choledochotomy.*

CASE 421.—Mr. C., aged twenty, seen with Dr. Stewart, Thornton. The patient had been jaundiced off and on for eight years ; during that time he had had several distinct attacks of pain, the first attack being two years after the onset of the jaundice ; there had been no loss of flesh ; the pulse was feeble, and there was a mitral bruit ; some albumin in the urine ; slight enlargement of the liver and enlargement, with tenderness, of the gall-bladder. The patient was seen 'three months after the previous notes had been taken,' just after a severe attack of pain over the gall-bladder. The jaundice had become much deeper, and the liver and spleen were considerably enlarged. Fine pancreatic crystals found.

*Operation.*—25/2/1902. Cholecystotomy ; very dark gall-stones were removed from the gall-bladder and cystic duct ; some soft stones crushed in the common duct, and removed by scoop through choledochotomy opening ; pancreas swollen.

*After-History.*—The patient made a good recovery from the operation. A tube was worn in the gall-bladder for about a year, and through this the ducts were irrigated with sterilized oil ; the patient ultimately made a good recovery.



*Gall-stones : Cholecystotomy.*

CASE 422.—Mrs. R., aged fifty-two, seen with Dr. Gregor, Crow Park. Patient had had symptoms of gall-stones for several years, and frequently recurring attacks of pain, with rise of temperature, but no jaundice.

*Operation.*—26/2/1902. Cholecystotomy; several stones impacted in the cystic duct were removed.

*After-History.*—Good recovery; well in June, 1903. (See Case 528.)

*Gall-stones : Cholecystotomy.*

CASE 423.—Mary T., aged sixty-six, admitted to the infirmary, February 24, 1902. Well up to six weeks ago, when she had a severe attack of biliary colic; since then the attacks had been more frequent and severe, and accompanied by vomiting; no jaundice, and no enlargement of the gall-bladder.

*Operation.*—27/2/1902. Cholecystotomy; several stones removed from the gall-bladder and cystic duct.

*After-History.*—Good recovery.

*Catarrhal Cholecystitis : Laparotomy.*

CASE 424.—Ruth H., aged thirty-three, admitted to the infirmary, February 22, 1902. Pain half an hour after food; never vomited blood; attacks of pain in gall-bladder region, accompanied by swelling there, and usually followed by jaundice, recently by temperature and chills during attacks; stomach not dilated; slight jaundice present.

*Operation.*—6/3/1902. Laparotomy; no gall-stones found; apparently catarrhal cholecystitis.

*After-History.*—Good recovery; well, 1903.

*Gall-stones in Common Duct, Jaundice and Infective Cholangitis : Choledochotomy.*

CASE 425.—Mrs. R., aged fifty-two, seen with Dr. Althorp, Bradford. For the past few months the patient had been suffering from rigors, with tingeing of the conjunctivæ, though no deep jaundice; great loss of flesh; a tumour had been present and some dilatation of the stomach; during the attacks the temperature had risen to 103° F., and vomiting had been severe.

*Operation.*—6/3/1902. Choledochotomy; removal of several gall-stones; duct sutured.

*After-History.*—Good recovery; well, March, 1903.

*Gall-stones : Choledochotomy and Cholecystotomy.*

CASE 426.—Mrs. P., aged thirty-seven, seen with Dr. Haigh, Golcar. For four or five years had suffered from attacks of biliary

colic ; the last two attacks had been extremely severe, and were followed by jaundice ; the patient had just recovered from an attack, and there was a slight icteric tinge ; some swelling over the gall-bladder present, with great tenderness.

*Operation.*—12/3/1902. Cholecystotomy : one stone removed from the gall-bladder ; choledochotomy : one stone removed from the cystic duct.

*After-History.*—The patient made a good recovery.

*Gall-stones in Common Duct, Jaundice and Infective Cholangitis :  
Choledochotomy and Cholecystotomy.*

CASE 427.—Mrs. M., aged sixty, seen with Sir Dyce Duckworth, Sir Henry Blanc, and Dr. Hort. History of gall-stones for some years, with jaundice and infective cholangitis for three months ; loss of flesh and strength.

*Operation.*—19/3/1902. Pus and gall-stones removed from the gall-bladder by cholecystotomy, and several gall-stones removed from the common duct by choledochotomy ; common duct opening closed by suture ; gall-bladder drained.

*After-History.*—Uninterrupted recovery ; patient well, 1903.

*Gall-stones : Cholecystotomy.*

CASE 428.—Miss W., aged thirty-five, seen with Dr. Scatterty, Keighley. For some months had suffered from attacks of biliary colic ; several gall-stones had been passed, but lately the attacks had become more frequent and severe.

*Operation.*—4/4/1902. Cholecystotomy ; fifteen stones removed from the gall-bladder and cystic duct.

*After-History.*—The patient made a good recovery, and remains well.

*Gall-stones, Jaundice, Acute Pancreatitis : Cholecystotomy.*

CASE 429.—Mr. S., seen with Dr. Nettle, Liskeard. (See p. 127.)

*Gall-stones, Epilepsy, Morphinomaniac : Cholecystotomy.*

CASE 430.—Mrs. McG., aged forty-eight, seen with Dr. France, Bury. For many years had suffered from biliary colic ; several years ago had acute pneumonia, since which time the pains had been more severe ; during several of the attacks she had had epileptic seizures ; some gall-stones had been passed, but not recently. The pain for several months had recurred five or six times during the twenty-four hours, and had been so severe that she had become addicted to morphia. There had been some distension of the gall-bladder and slight enlargement of the liver, but no rigors. Patient took 3 grains of morphia at each injection.

*Operation.*—8/4/1902. Cholecystotomy ; contracted and thickened

gall-bladder; some stones removed from the gall-bladder and cystic duct.

*After-History.*—Patient died a week later from pneumonia.

*Gall-stone in Ampulla of Vater, Cirrhosis of Liver: Duodeno-choledochotomy. Subsequent Cancer of Pancreas (?)*.

CASE 431.—Mr. E., aged fifty-eight, seen with Dr. Cooke, Bath. Patient had been subject to painful indigestion for a year or two. Never had severe pain until April, 1900, when, after a chill, he had an attack of acute pain over the liver, followed by jaundice. He had had attacks of pain two or three times since, followed by deepening of the jaundice; the last attack occurred three days previously, and the jaundice persisted. He had lost considerably in weight. The right lobe of the liver was enlarged and smooth; there was no distension of the gall-bladder, and no tenderness could be elicited.

*Operation.*—8/4/1902. A gall-stone impacted at the ampulla was removed by duodeno-choledochotomy, and cholecystotomy was performed for drainage; hypertrophic cirrhosis of the liver.

*After-History.*—Patient made a good recovery from the operation, though there was some leakage from the duodenum for some time. He remained well for nearly a year, when he had a recurrence of jaundice with severe pain, rapid enlargement of the liver, ascites and profuse hæmatemesis, from which he died after a short illness. I suspect cancer of the pancreas had supervened.

*Gall-stones in Common Duct, Jaundice: Duodeno-choledochotomy.*

CASE 432.—James B., aged fifty-four, admitted to the infirmary, April 7, 1902. Eight years ago had had attacks of biliary colic, followed by jaundice. He was jaundiced for a month, and then recovered; since then had had frequent attacks. Three weeks ago had a very severe seizure, again followed by jaundice, which had persisted.

*Operation.*—11/4/1902. Liver enlarged and cirrhotic; gall-bladder shrunken; duodeno-choledochotomy; forty-seven gall-stones removed from the common duct; duodenum closed; abdomen drained.

*After-History.*—Good recovery.

*Acute Cholecystitis, Gall-stones: Cholecystotomy.*

CASE 433.—Mrs. K., aged forty-eight, seen with Dr. Coward, Huddersfield. Previous history of gall-bladder pain for several years; acute symptoms, with painful diffuse swelling in gall-bladder region for ten days.

*Operation.*—17/4/1902. Inflamed and thickened gall-bladder,

surrounded by adhesions and containing muco-pus and gall-stones, with some impacted in the cystic duct; cholecystotomy performed; gall-stones removed; drainage.

*After-History.*—Good recovery.

*Gall-stones in Common Duct, Suppurative Cholangitis: Choledochotomy; Cholecystectomy.*

CASE 434.—Mrs. J., aged forty-one, seen with Dr. Riley, Sale. (See p. 117.)

*Cholelithiasis: Cholecystotomy; Choledochotomy.*

CASE 435.—Rose S., aged fifty-six, seen at the Leeds General Infirmary, suffering from jaundice, with continuous pain on the right side of the abdomen. The jaundice had been present for months, and she had been subject to ague-like attacks since December, 1901.

*Operation.*—2/5/1902. Gall-stones removed from the gall-bladder and common duct by cholecystotomy and choledochotomy.

*After-History.*—The patient made a good recovery, and was able to leave the hospital on May 28.

*Gall-stones in Common Duct and Stricture of Papilla: Choledochotomy and Duodeno-choledochotomy.*

CASE 436.—Mrs. T., aged fifty, seen with Dr. Lawrence, Darlington. (See p. 115.)

*Injury of Hepatic Duct.*

CASE 437.—Austin M., aged twenty-five, seen at the Leeds General Infirmary. (See p. 53.)

*Gall-stones in Common Duct, Chronic Pancreatitis: Choledochotomy.*

CASE 438.—Mr. M., aged forty-eight, seen with Dr. Clifford, Stalybridge. For five years had been subject to attacks of pain over the liver and gall-bladder; under treatment at Harrogate had been greatly relieved. There was no persistent jaundice, though it recurred after each attack; during the last three months jaundice had been present, and he had lost 30 pounds in weight. He had ague-like attacks from time to time; the liver was enlarged and tender; no enlargement of the gall-bladder; crowds of fine pancreatic crystals found.

*Operation.*—13/5/1902. Choledochotomy; one gall-stone removed from the common duct; duct sutured; abdomen drained; pancreas swollen.

*After-History.*—Patient made a good recovery, and was well, June, 1903.

*Gall-stones in Common Duct : Choledochotomy and Cholecystotomy.*

CASE 439.—Margaret G., aged fifty-six, admitted to the General Infirmary, May 8, 1902. For thirty years had had occasional attacks of biliary colic; lately the attacks had become more severe, and were followed by jaundice, which had persisted between the seizures; shivering attacks: loss of flesh.

*Operation.*—15/5/1902. Choledochotomy; twenty stones removed from the common duct; duct sutured; cholecystotomy for drainage.

*After-History.*—The patient made a good recovery.

*Typhoidal Cholecystitis, with Suppurative Cholangitis, Gall-stones in Hepatic Duct, Gall-bladder duodenal Fistula : Hepato-cholecholemy and Drainage of Hepatic Duct.*

CASE 440.—Alice A., aged twenty-four, admitted to the infirmary, May 5, 1902. In September, 1901, the patient had had typhoid fever, and was in bed for nine weeks with some complication, said to be peritonitis. Three weeks ago became deeply jaundiced, with attacks of severe pain in right hypochondriac region going through to the back; jaundice had varied in intensity from time to time, but had never disappeared; it was accompanied by high temperature, rigors, sweating, and loss of flesh. No enlargement of gall-bladder or liver could be felt; tenderness above and to the right of the umbilicus. Patient thin and wasted.

*Operation.*—15/5/1902. Very firm adhesions around gall-bladder; gall-bladder duodenal fistula; gall-bladder distended with offensive pus; large gall-stone found in hepatic duct; fistula in duodenum closed by sutures. Hepato-cholecholemy; removal of concretion; partial removal of gall-bladder and drainage of hepatic duct.

*After-History.*—Death from shock. Post-mortem examination showed common and hepatic ducts quite clear; no peritonitis; hepatic duct dilated, nearly an inch in diameter; large gall-stone impacted in the substance of the liver; suppurative cholangitis.

*Chronic Catarrh of the Gall-bladder : Cholecystotomy; Hydronephrosis; Nephrotomy; Nephropexy.*

CASE 441.—Rose F., aged forty-two, seen at the Leeds General Infirmary. Symptoms of pain on right side of the abdomen for twelve years, which were associated with irritability of the bladder. More recently the pain began in the gall-bladder region, and passed to the shoulder. A tumour, clearly kidney, could easily be felt, and above this could be recognised a distended gall-bladder.

*Operation.*—15/5/1902. Chronic catarrh of the gall-bladder discovered, and cholecystotomy performed. The kidney tumour

proved to be a hydronephrosis, for which nephrotomy and nephropexy were done.

*After-History.*—The patient made a good recovery, and was made an out-patient on June 7.

*Gall-stones : Cholecystotomy.*

CASE 442.—Ann S., aged forty-five, admitted to the General Infirmary, May 12, 1902. For sixteen years attacks of biliary colic, lately loss of flesh and vomiting; attacks increasing in severity.

*Operation.*—22/5/1902. Cholecystotomy; 450 stones removed.

*After-History.*—Good recovery.

*Cholelithiasis, Jaundice and Infective Cholangitis : Choledochotomy and Cholecystotomy.*

CASE 443.—Margaret P., aged thirty-five, seen at the Leeds General Infirmary, suffering from jaundice with infective cholangitis, the jaundice having been present since October, 1901, though she had been subject to attacks of pain with distinct jaundice since July of that year.

*Operation.*—23/5/1902. Cholecystotomy performed, and three large stones removed. A gall-stone could be felt floating in a very much enlarged common duct: this was removed by choledochotomy.

*After-History.*—The patient made a good recovery, and was able to return home on June 14.

*Typhoid Infection of Bile-duct in Liver, Abscess of Liver : Hepatotomy.*

CASE 444.—Stephen N., aged twenty-five, admitted to the General Infirmary, May 30, 1902. A year previously the patient had had an attack of enteric fever in South Africa, and was in bed about three weeks. He made a good recovery, and was quite well up to a week ago, when a swelling was noticed in the epigastrium, which was somewhat tender and painful. During the last few days the swelling had increased in size, and become more painful; there had been no sickness, vomiting, or jaundice; very slight rise of temperature, but no constitutional disturbance. In the subcostal angle there was a smooth swelling, dull on percussion, which was tender to pressure. The liver was enlarged, but there were neither jaundice nor dilatation of the stomach.

*Operation.*—30/5/1902. A vertical incision, 2 inches in length, was made over the tumour. On dividing the peritoneum, an abscess was opened, containing about 4 ounces of pus. The

cavity was explored, and found to extend into the left lobe of the liver; this was drained. No gall-stones discovered.

*After-History.*—The patient made a good recovery.

*Cancer of Pancreas : Cholecystotomy.*

CASE 445.—Mr. D., aged fifty-nine, seen with Dr. Levick, Middlesborough. Nine months ago jaundice came on suddenly with pain, but no digestive disturbance. Patient had never been subject to attacks of biliary colic; no shivering attacks, but great loss of flesh. The liver was enlarged to the level of the umbilicus; some enlargement of the gall-bladder; no ascites; slowly soluble pancreatic crystals found in urine.

*Operation.*—2/6/1902. Cholecystotomy; a hard mass in the head of the pancreas, probably malignant.

*After-History.*—Patient made a good recovery from the operation, and left with a biliary fistula. He was greatly relieved and lived until January, 1903.

*Catarrhal Cholecystitis, Adhesions : Gastrolysis.*

CASE 446.—Mary F., aged forty, seen at the General Infirmary, May 28, 1902. For several years had had attacks of pain in the abdomen; lately had suffered from distension of the abdomen, with severe pain and vomiting.

*Operation.*—3/6/1902. Adhesions around the gall-bladder and pylorus separated.

*After-History.*—Good recovery.

*Gall-stones, Jaundice, and Infective Cholangitis : Chronic Pancreatitis ;  
Choledochotomy and Cholecystotomy.*

CASE 447.—Mary M., aged fifty-three, admitted to the General Infirmary, May 27, 1902. For twelve months had had attacks of biliary colic; lately the attacks had been more severe, accompanied by vomiting, ague-like attacks, and jaundice. Patient had lost flesh considerably. Great tenderness above and to the right of the umbilicus. Fine pancreatic crystals found.

*Operation.*—3/6/1902. Choledochotomy; stones removed from the common duct; cholecystotomy for drainage; swollen pancreas.

*After-History.*—Good recovery.

*Catarrh of Gall-bladder and (?) Chronic Pancreatitis : Cholecystotomy.*

CASE 448.—Mr. D., aged sixty-one, seen with Dr. Pennefather, Herne Hill, and Dr. W. G. Fletcher, London. For twelve years patient had been subject to attacks of pain over the gall-bladder, accompanied by sickness, but no jaundice. The pain lately had become more acute, and a slight icteric tinge was present. No enlargement of the liver or gall-bladder, but tenderness above the umbilicus elicited.

*Operation.*—5/6/1902. Cholecystotomy; gall-bladder enlarged and thickened, adherent to the pylorus and omentum. The adhesions were detached, and the gall-bladder drained. The head of the pancreas was a little enlarged.

*After-History.*—Patient made a good recovery from the operation, but for a time after the drainage was given up he had slight recurrences of pain, which ultimately cleared up, and in June, 1903, he was quite well.

*Tumour of Gall-bladder, Catarrhal Cholecystitis : Cholecystotomy.*

CASE 449.—Ada McL., aged twenty-nine, admitted to the General Infirmary, June 10, 1902. For four or five years had had attacks of biliary colic and vomiting. Lately the pain had been constant, and the severe attacks had been followed by jaundice. Tenderness above and to the right of the umbilicus, with enlargement of the gall-bladder.

*Operation.*—18/6/1902. Cholecystotomy.

*After-History.*—Good recovery.

*Catarrhal Cholecystitis : Cholecystotomy.*

CASE 450.—Mary B., aged forty-two, admitted to the General Infirmary, June 18, 1902. Eighteen months ago had attacks of abdominal pain, accompanied by vomiting, since which time the attacks had been frequent and severe; no jaundice; considerable tenderness above the umbilicus; no dilatation of the stomach.

*Operation.*—24/6/1902. Chronic catarrh of the gall-bladder, but no gall-stones; cholecystotomy.

*After-History.*—Good recovery.

*Gall-stones in Hepatic and Common Ducts : Choledochotomy.*

CASE 451.—Mrs. L., aged seventy, seen with Dr. Gross, Clapham. Patient had had gall-stone symptoms for three years, and at times jaundice. Lately the attacks had become very frequent, accompanied by fever, ague-like seizures, loss of flesh, and jaundice. The liver was slightly enlarged, and there was tenderness over the gall-bladder, but no enlargement of it.

*Operation.*—17/7/1902. Choledochotomy; numerous gall-stones removed from the common and hepatic ducts; duct sutured; abdomen drained.

*After-History.*—Patient made a good recovery, and was well some months later.

*Gall-stones in Hepatic and Common Ducts : Choledochotomy.*

CASE 452.—Mrs. H., aged fifty-two, seen with Dr. Mercer, Ripponden. Lately subject to attacks of pain after food. The pain was in the centre of the epigastrium, passing through to the



shoulder, the symptoms having been intermittent for some time. A week ago a faceted gall-stone was passed, but there had been no relief, and the pain had been continuous and increasing in severity, with slight jaundice. No enlargement of the gall-bladder, except during the attacks.

*Operation.*—25/7/1902. Choledochotomy; fifteen stones removed from the common and hepatic ducts by means of a scoop passed through the incision in the common duct; abdomen drained; duct sutured.

*After-History.*—The patient made a good recovery, and remains well.

*Cholelithiasis, Empyema of Gall-bladder: Cholecystotomy.*

CASE 453.—Mrs. H., seen with Dr. Footner, Tunbridge Wells. For some years had been subject to spasms, and only lately had the attacks been followed by jaundice. After an attack, more acute than usual, a swelling developed in the gall-bladder region; this was associated with great pain, marked tenderness, some elevation of temperature, and slight jaundice. As the symptoms were getting worse and there was clearly local peritonitis, operation was decided on.

*Operation.* — 30/7/1902. Cholecystotomy; gall-bladder was found to be distended with pus, and contained several gall-stones; others were found impacted in the cystic duct. The gall-bladder was emptied and drained after the removal of the gall-stones.

*After-History.*—I had a letter in 1903 from Dr. Footner to say that the patient was in very good health.

*Cirrhosis of Liver, Ascites, Jaundice: Cholecystotomy and Epiplopexy.*

CASE 454.—Mrs. I., aged thirty-two, seen with Dr. Clampitt, Bootle. Patient was quite well up to five years ago, when she began to suffer from swelling of the joints and general weakness. A year ago began to suffer from pain over the gall-bladder, with swelling of the abdomen, loss of flesh, and diarrhoea. The abdominal swelling increased rapidly; lately the patient had become jaundiced; the liver was a little enlarged and cirrhotic, and there was some ascites.

*Operation.*—6/8/1902. Cholecystotomy and epiplopexy for cirrhosis of the liver; gall-bladder drained.

*After-History.*—Patient recovered from the operation, but died six months later from the progress of the disease.

*Gall-stones: Cholecystotomy.*

CASE 455.—Mr. M., aged fifty-seven, seen with Dr. Spawson, Blackpool. For six months had suffered from attacks of biliary

colic, several small stones having been passed. The attacks had recently recurred once a week, and there had been a slight tinge of jaundice with some loss of flesh; no enlargement of the gall-bladder.

*Operation.*—25/9/1902. Cholecystotomy; 145 gall-stones removed.

*After-History.*—Patient made a good recovery.

*Gall-stones : Duodeno-choledochotomy and Cholecystotomy.*

CASE 456.—A lady, seen with Dr. Maling and Dr. Robinson, Sunderland. Fifteen years' history of gall-stone seizures, with freedom from the attacks for several years; lately the attacks had been frequent. Slight jaundice had come on a fortnight ago and had gradually deepened; some fever and local peritonitis; swelling of the gall-bladder and enlargement of the right lobe of the liver.

*Operation.*—30/9/1902. Cholecystotomy; twenty-three gall-stones removed from the gall-bladder, with a pint of bile-stained muco-pus; one stone in the ampulla of Vater removed by duodeno-choledochotomy; no drainage of the abdomen; drainage of the gall-bladder.

*After-History.*—The patient made a good recovery, and is now well.

*Cancer of Pancreas : Cholecystenterostomy.*

CASE 457.—Mrs. B., aged sixty-nine, seen with Dr. Everley Taylor, Scarborough. For ten months had suffered from ague-like attacks, with loss of flesh and gradually deepening jaundice; enlargement of the liver and gall-bladder.

*Operation.*—2/10/1902. Cholecystenterostomy; Murphy's button used; malignant disease of the head of the pancreas.

*After-History.*—Patient died a week later from exhaustion, due to duodenal leakage, which occurred at time of separation of button.

*Cancer of Gall-bladder and Liver : Exploratory Operation.*

CASE 458.—John W., aged sixty-four, admitted to the infirmary, September 25, 1902. Some years ago had attacks of abdominal pain and flatulence with jaundice. These attacks passed off, and he was well up to five weeks ago, when jaundice appeared and had become deeper since. Comparatively little pain; liver and gall-bladder enlarged; considerable loss of flesh.

*Operation.*—3/10/1902. Exploratory laparotomy; large mass of malignant disease found, involving the gall-bladder and liver; secondary growths in the peritoneum.

*After-History.*—Good recovery from operation, and returned home.

*Empyema of Gall-bladder, Gall-stones : Cholecystotomy.*

CASE 459.—Mrs. H., aged forty-eight, seen with Dr. Woodcock, Leeds. (See p. 87.)

*Cancer of Liver and Gall-bladder : Exploratory Operation.*

CASE 460.—Mrs. B., aged fifty-three, seen with Dr. Russell Coombe, Exeter. For eighteen years the patient had been subject to attacks of biliary colic, but had never been jaundiced ; six months ago a tumour was noticed in the abdomen, and the patient had been losing weight and strength rapidly ; there had been considerable pain ; the right lobe of the liver was enlarged, and the gall-bladder was distended.

*Operation.*—13/10/1902. Exploratory laparotomy ; carcinoma of the liver and gall-bladder, incapable of removal.

*After-History.*—Patient recovered from the operation.

*Cancer of Head of Pancreas : Cholecystotomy.*

CASE 461.—Mr. M., aged sixty-eight, seen with Dr. Mackay, Knaresborough. Eight months' history of abdominal pain and rapid loss of flesh, with vomiting, but no jaundice ; some dilatation of the stomach present.

*Operation.*—21/10/1902. Exploratory ; carcinoma of the head of the pancreas found ; cholecystotomy.

*After-History.*—Patient recovered from the operation, and lived for five months.

*Gall-stones : Cholecystotomy.*

CASE 462.—Harriet B., aged twenty-seven, admitted to the infirmary, October 20, 1901. Patient had suffered from biliary colic for twelve months, attacks becoming more frequent, accompanied by shivering and jaundice ; enlargement of right lobe of liver, with tenderness over gall-bladder.

*Operation.*—23/10/1902. Cholecystotomy ; twenty stones removed.

*After-History.*—Good recovery.

*Gall-stones : Cholecystotomy ; Gastrolisis.*

CASE 463.—Miss B., aged sixty-one, seen with Dr. Brook, Lincoln. Patient had been subject to attacks of spasms for many years, and had lately become an invalid. Slight icteric tinge, but no definite jaundice, followed the attacks ; stomach symptoms prominent, and marked dilatation present.

*Operation.*—26/10/1902. Cholecystotomy; several gall-stones removed from the gall-bladder, and one the size of a cherry from the commencement of the cystic duct; adhesions between the gall-bladder and pylorus separated.

*After-History.*—Patient made a good recovery; well, July, 1903.

*Gall-stones : Cholecystotomy.*

CASE 464.—Emma F., aged thirty-one, admitted to the infirmary, October 24, 1902. For three years had had attacks of biliary colic, last attack followed by jaundice; tenderness on deep pressure in mid-line,  $1\frac{1}{2}$  inches above the umbilicus.

*Operation.*—30/10/1902. Cholecystotomy; one large and several small gall-stones removed from the gall-bladder.

*After-History.*—Good recovery.

*Cancer of Pancreas, Ascites : Exploratory Operation.*

CASE 465.—Mary T., aged fifty-one, admitted to the infirmary, October 29, 1902. Painless onset of jaundice a year ago; rapid loss of flesh lately; enlargement of the liver; no tenderness or enlargement of gall-bladder.

*Operation.*—30/10/1902. Exploratory operation; mass of enlarged glands in hepatic fissure; enlargement of liver; ascites; growth in head of pancreas.

*After-History.*—Recovery from operation.

*Gall-stones in Common Duct, Absence of Jaundice : Choledochotomy ; Cholecystotomy.*

CASE 466.—Miss H., aged fifty-seven, seen with Dr. Garrad, Starbeck. Patient had suffered from epigastric pain for five years; the attacks were very acute, and accompanied by vomiting. No hæmatemesis or jaundice; there had been some loss of flesh; no enlargement of the gall-bladder, but considerable tenderness.

*Operation.*—4/11/1902. Cholecystotomy; several gall-stones removed from the gall-bladder; one stone firmly impacted in the common duct removed by choledochotomy. It is noteworthy that in this case, although there was a stone in the common duct, there was no jaundice.

*After-History.*—Patient made a good recovery; well, June, 1903.

*Gall-stones : Cholecystotomy.*

CASE 467.—Miss H., aged thirty-eight, seen with Dr. Squance, Sunderland. Attacks of biliary colic for many years; patient had never been jaundiced, but lately the attacks had become more frequent, and there had been loss of flesh and strength. The gall-bladder was enlarged, distended, and very tender.

*Operation.*—10/11/1902. Cholecystotomy; several gall-stones removed from the gall-bladder and cystic duct.

*After-History.*—Patient made a good recovery, and remains well.

*Chronic Pancreatitis; Hourglass Gall-bladder : Partial Cholecystectomy ; Cholecystotomy.*

CASE 468.—Fred B., aged fifty-eight, seen at the infirmary. For years had been subject to attacks of biliary colic, and ten years before had had jaundice, which passed off. Two months previous to admission had severe pain, followed by jaundice. He had had three rigors since, and the jaundice had persisted. No distension of the gall-bladder. Pancreatic crystals found in urine.

*Operation.*—21/11/1902. Partial cholecystectomy and cholecystotomy; hourglass gall-bladder; no calculi discovered, but hardening of the head of the pancreas felt (chronic pancreatitis). The distal portion of the gall-bladder was removed, and a tube inserted into the proximal end.

*After-History.*—Patient recovered from the operation, and improved very markedly. He gained flesh and strength, but whenever the fistula closed he became jaundiced, though the small sinus only discharged a little bile, even with a tube inserted. For further history, see Case 538.

*Cholecystitis : Cholecystectomy.*

CASE 469.—Michael C., aged thirty-eight, seen at the infirmary. For twelve months had been subject to attacks of biliary colic; during the last attack the patient was jaundiced; no enlargement of the gall-bladder.

*Operation.*—25/11/1902. Cholecystectomy; gall-bladder small, contracted, and adherent to pylorus and bowel; no gall-stones found; gall-bladder removed.

*After-History.*—Patient made a good recovery.

*Cancer of Liver : Exploratory Operation.*

CASE 470.—Mrs. P., aged sixty, seen with Dr. Hutchinson, Bridlington. Failure of health for one year; gradual enlargement of the abdomen, rapid loss of flesh. No jaundice, but liver greatly enlarged.

*Operation.*—25/11/1902. Exploratory; primary malignant disease of the liver, with pedunculated right lobe; gall-bladder small; nodules on surface of liver.

*After-History.*—Patient recovered from the operation, and lived until May, 1903.

*Gall-stones : Cholecystotomy.*

CASE 471.—Mrs. W., aged fifty-nine, seen with Dr. Dobie, Keighley. Had suffered from painful attacks of indigestion for some years; lately after an attack of pain there had been slight jaundice, with some swelling and tenderness of the gall-bladder. No ague-like attacks; no serious loss of flesh; slight jaundice present.

*Operation.*—26/11/1902. Cholecystotomy; gall-bladder full of mucus and walls acutely inflamed; two gall-stones removed about the size of walnuts, one impacted in the cystic duct; several other small stones removed at the same time.

*After-History.*—Patient made a good recovery.

*Gall-stones : Cholecystotomy.*

CASE 472.—Mrs. R., aged fifty-nine, seen in London with Dr. Huxley and Dr. Armstead, suffering from repeated attacks of biliary colic, associated with very slight jaundice and marked tenderness over the gall-bladder.

*Operation.*—1/12/1902. Cholecystotomy; numerous gall-stones removed from the gall-bladder and cystic duct.

*After-History.*—Good recovery; well, June, 1903.

*Gall-stone : Cholecystotomy.*

CASE 473.—Mr. T., aged thirty, seen with Dr. Wylie, Salisbury. Three years ago had an attack of biliary colic, but was quite well, 'with the exception of one other attack,' up to three months ago. Since then he had had numerous attacks, and though there had been no manifest jaundice, there was an icteric tinge of the conjunctiva. No enlargement of the gall-bladder.

*Operation.*—4/12/1902. Cholecystotomy; one gall-stone impacted in the cystic duct removed by scoop through cholecystotomy incision.

*After-History.*—Patient made a good recovery, and is now quite well.

*Gall-stones : Cholecystotomy.*

CASE 474.—Mrs. S., aged sixty-three, seen with Dr. Lockwood, Halifax. For about six years had suffered from spasms and acute indigestion, but for fifteen months the attacks had been more severe, and localized in the right hypochondriac region. There had occasionally been slight jaundice after the attacks; no loss of flesh, but the patient had become weak and unable to carry out her home duties.

*Operation.*—17/12/1902. Cholecystotomy; 198 gall-stones removed from the gall-bladder and cystic duct.

*After-History.*—Patient made a good recovery.

*Cancer of Pancreas : Cholecystotomy.*

CASE 475.—Mr. W., aged fifty-five, seen with Dr. Claremont, Southsea. Never had attacks of biliary colic, but had been subject to dyspepsia; six months ago had a rigor, followed by jaundice; had had repeated rigors since, but without pain of any kind; vomiting at times, with marked loss of flesh; some enlargement of the liver and gall-bladder; had lost 2 stones in weight; bulky, fatty, pale motions; coarse pancreatic crystals in urine.

*Operation.*—2/1/1903. Cholecystotomy; enlargement of the head of the pancreas, probably malignant; gall-bladder distended.

*After-History.*—Recovery. Two months later the patient was gradually losing ground. All the bile was draining through the fistula. There was no jaundice, and he was free from pain. Lived for eight months.

*Gall-stones, Jaundice, and Infective Cholangitis : Choledochotomy.*

CASE 476.—Maria B., aged sixty-two, seen at the Leeds General Infirmary. Fourteen years' history of biliary colic, but for six months the attacks had become frequent and were followed by jaundice, which usually persisted for four or five days. The attacks were associated with rigors, and the patient became enfeebled and very ill. Some enlargement of the right lobe of the liver noticed on admission, but no distension of the gall-bladder and no jaundice.

*Operation.*—7/1/1903. Cholecystotomy and choledochotomy; one stone removed from the common duct, and several from the gall-bladder; duct sutured; gall-bladder drained.

*After-History.*—Patient made a good recovery, and was well in April, 1903.

*Gall-stones : Cholecystotomy.*

CASE 477.—Mr. M., aged sixty-four, seen with Dr. Newby, Grimsby. Fifteen years ago the patient used to have attacks of spasms, but was never jaundiced. He was free up to two years ago, when he had a typical attack of biliary colic, lasting for eight hours. Had had several attacks since, and had been slightly jaundiced. No enlargement of the gall-bladder, but tenderness above the umbilicus.

*Operation.*—8/1/1903. Cholecystotomy; small and contracted gall-bladder filled with calculi; extensive adhesions separated.

*After-History.*—Patient made a good recovery, and remains well.

*Chronic Pancreatitis : Cholecystotomy ; Gastrolisis.*

CASE 478.—Mrs. B., aged forty-four, seen with Dr. Lovely, Dawlish. Eighteen years ago both ovaries were removed by

Sir Spencer Wells. About a year ago the patient began to suffer from abdominal pain and diarrhœa. The diarrhœa persisted, the motions containing quantities of undigested food. The attacks of pain had also been frequent, and morphia had been required. The pain had always been localized—2 inches above the umbilicus and 2 inches to the right of the middle line—and when it was acute it passed through to the back. There had never been any vomiting or nausea. Up to the last week there had been no jaundice; no loss of flesh; urine gave pancreatic reaction.

*Operation.*—11/1/1903. Cholecystotomy; adhesions about the pylorus and gall-bladder detached and pancreatic swelling felt.

*After-History.*—Patient made a good recovery from the operation, and remained comparatively well for three months, when, after an attack of appendicitis, which had evidently been present before in a chronic form, appendicectomy and nephropexy were performed. Good recovery from the second operation; urine then gave no pancreatic reaction. When the abdomen was opened for appendicectomy the pancreas was felt to be normal in size.

*Septicæmia of Doubtful Origin, apparently from Infected Bile-ducts :  
Cholecystotomy.*

CASE 479.—Mr. B., aged forty-eight, seen with Dr. Mitchell Bruce, Dr. Marshall, and Dr. Mackintosh. Since an illness associated with fever and called influenza four months previously had never been well enough to get out, and barely able to get up. Intermittent feverish attacks associated with rigors, great depression, and loss of flesh, but without pain, culminated in continuous fever, with exacerbations, associated with enlargement of the liver and gall-bladder, with some tenderness there. It was thought that there might be suppurative cholangitis, which might be relieved by drainage. Nothing else definitely to be made out, except soft mitral cardiac bruit and some laryngeal catarrh.

*Operation.*—12/1/1903. Cholecystotomy performed, and a quantity of bile evacuated from the gall-bladder, apparently giving immediate relief. The wound healed by first intention, but as soon as the drainage of bile ceased, at the end of a fortnight, the fever returned, and with it all the previous symptoms, which within a few weeks led to a fatal termination. The bile was free from pus, but contained bacilli actively growing aerobically and anaerobically in all kinds of media. Mr. Eastes said that he was unable to identify them with any previously described, but cultivations made by Dr. Eyre, bacteriologist to Guy's Hospital, and injected into guinea-pigs and rabbits, produced no ill effects. The pancreas was much swollen, but no fluctuation could be felt.



*Gall-stones in Common Duct, Cholecystitis: Cholecystectomy and Duodeno-choledochotomy.*

CASE 480.—Mrs. K., aged fifty-nine, seen with Dr. Rolleston and Dr. Swan, London. History of gall-stones for two or three years, and of jaundice with ague-like attacks for nine months, with great loss of flesh during the latter period; right lobe of the liver markedly enlarged; no distension of the gall-bladder; tenderness above and to the right of the umbilicus.

*Operation.*—17/1/1903. Small, shrunken gall-bladder removed by cholecystectomy; very firm adhesions between the pylorus, duodenum, gall-bladder, and liver, detached. During the manipulations one gall-stone was forced into the ampulla of Vater, and thence into the duodenum, whence it was extracted by duodeno-choledochotomy.

*After-History.*—Patient made a good recovery, and left the surgical home at the month end; quite well, July, 1903.

*Gall-stones in Common Duct, Pancreatitis: Choledochotomy.*

CASE 481.—Mrs. P., aged sixty-one, seen with Dr. Pemberton, Burnley. (See p. 128.)

*Gall-stones: Cholecystotomy.*

CASE 482.—Mrs. A., aged fifty-two, seen with Dr. Applegate, Dewsbury. Patient had had spasms for years, but had never been jaundiced; two years ago had a severe attack of pain, and bile appeared in the urine; lately had had other severe attacks, followed by jaundice; there had been great loss of flesh. When seen there was some slight dilatation of the stomach, and the right lobe of the liver was somewhat enlarged, but no distension of the gall-bladder could be made out; there was decided tenderness just above and to the right of the umbilicus.

*Operation.*—22/1/1903. Cholecystotomy; six large and innumerable small stones removed from the gall-bladder and cystic duct.

*After-History.*—Patient made a good recovery; well, July, 1903.

*Gall-stones in Common Duct, Infective Cholangitis: Choledochotomy; Cholecystectomy; Enterorrhaphy.*

CASE 483.—Mr. I., aged fifty, seen with Dr. Brown, Taunton. (See p. 114.)

*Suppurative Cholangitis, Dilated Common Duct, Cancer of Pancreas: Choledochostomy.*

CASE 484.—Mr. R., aged seventy-five, seen with Dr. Curd and Dr. Cooke, Bath. Patient was fairly well up to a fortnight ago, when he was seized with a severe pain at the epigastrium, which caused him to faint. The next day jaundice appeared, and became

intense. A week ago he had fever, with temperature, which had since been high, on one occasion  $105^{\circ}$  F. There was no tenderness or rigidity of the recti; slight enlargement of the liver; some hæmorrhagic areas in the skin; pulse very feeble. On further questioning it was found that the patient had had three previous attacks of abdominal pain, but without jaundice. Coarse pancreatic crystals in urine suggestive of cancer.

*Operation.*—30/1/1903. Choledochostomy; extensive adhesions; gall-bladder small and shrunken; cystic and common ducts dilated to the size of the small intestine; the ducts were aspirated, and 8 ounces of cloudy, purulent bile removed; no gall-stones found; tube sutured into an opening in the common duct; hardness felt in head of pancreas.

*After-History.*—Patient died fourteen days later from exhaustion.

*Cancer of Gall-bladder and Liver : Cholecystectomy and Hepatectomy.*

CASE 485.—Mr. B., aged fifty-five, seen in London with Dr. Berry. Thirty-seven years ago patient had had catarrhal jaundice, lasting a week or two, and had suffered from attacks of epigastric pain, said to be indigestion; at forty-four had had an attack of pain followed by jaundice, which lasted a month, and then had a dull, aching pain in the epigastrium; latterly the pain had become more severe, and he had lost weight; there was a nodular tumour below the liver, apparently the gall-bladder; no ascites.

*Operation.*—5/2/1903. Cancer of the gall-bladder, which also contained gall-stones; nodule of growth in the liver from extension; cholecystectomy and partial hepatectomy; elastic ligature and hysterectomy pins employed.

*After-History.*—Patient recovered from the operation, and moved to the seaside, where he succumbed four months later to secondary growths in the abdomen.

*Cancer of Pancreas : Cholecystenterostomy.*

CASE 486.—Mr. A., aged fifty-three. Two years ago had a severe attack of pain in the right hypochondrium; six months later had another attack, which was more severe and was followed by jaundice which lasted for six weeks; patient was very ill and lost weight rapidly; cholecystotomy was performed in January, 1901, by another surgeon. He was said to have had chronic pancreatitis at that time. A biliary fistula had persisted, though bile had been present in the motions off and on since the operation; he had had no pain since the operation, but on several occasions had had rigors, and on one occasion a temperature reaching to  $105^{\circ}$  F.; steady loss of weight; once, when the fistula closed for four days, jaundice returned. Coarse pancreatic crystals found in urine.

*Operation.*—5/2/1903. Cancer of the pancreas, which had probably started in the ampulla of Vater; cholecystenterostomy performed.

*After-History.*—Though the wound healed almost completely, the strength was not regained, and the patient died five weeks later from exhaustion. The Murphy's button employed for the anastomosis was passed on the tenth day.

*Cholelithiasis and Pancreatic Calculi: Cholecystotomy; Duodeno-choledochotomy; Pancreatotomy.*

CASE 487.—Mrs. W., aged fifty-seven, seen, February 1, 1903, with Sir Richard Douglas Powell. In August, 1901, the patient had several attacks of biliary colic, unaccompanied by jaundice; was seen by Sir Douglas Powell on August 24, and cholangitis diagnosed; since that time she had had frequent recurrences of pain, which she had called indigestion. In May, 1902, a serious attack occurred, requiring opiates for relief; this was followed by two or three severe seizures, after which she was better for a time. At Christmas, 1902, the attacks of pain became more frequent, and in the first week of January, 1903, she had to take to her bed. Vomiting occurred rather frequently, so that she was unable to take any food beyond a little milk. When I saw her with Sir Richard Douglas Powell, her pulse was 120, and feeble. There had been a moderate increase of temperature for several days; slight jaundice was present, but no enlargement of the gall-bladder could be felt. The region of the gall-bladder was, however, decidedly tender, and there was a well-marked area of tenderness on the left of the spine. She was vomiting everything, and was in such a poor condition that, although operation was indicated, it seemed improbable that she would be able to bear it. It was therefore decided to feed her by the bowel, and to stop all food by the mouth, to give strychnia subcutaneously and calcium chloride by the bowel, so as to try to get her into a little better condition. After ten days of this treatment she had improved so much that operation was decided on. A specimen of the urine sent to Mr. Cammidge was reported by him to contain pancreatic crystals, indicating pancreatitis.

*Operation.*—13/2/1903. A contracted gall-bladder was found, and seven gall-stones, together with mucus and pus, were removed from the cystic duct. The common duct was slightly dilated, and there was a decided hardness about the head of the pancreas. A hard nodule could be felt in the pancreas near to the common duct. This was cut down on, and found to be a white pancreatic stone about the size of a pea. It was removed and the pancreas sutured over it. The ampulla of Vater was then exposed by an

incision in the duodenum, the papilla being laid open over a director, and from the pancreatic duct another white calculus of the same size was extracted by forceps, after which a probe could be passed for  $1\frac{1}{2}$  inches along the pancreatic duct. At the same time the common bile-duct was explored and found to be free. An explanation was now sought for the pain which had been felt on the left side of the spine, and on pressing the finger through the lesser omentum a hard lump was felt about the centre of the pancreas, it being clearly a pancreatic calculus. The gastro-hepatic omentum was divided so as to give access to the lesser cavity of the peritoneum. An incision was then made through the pancreas into the main pancreatic duct, from which a calculus, the size of a cob-nut, was extracted by a scoop, it being firmly adherent to the duct. A large vessel was wounded, probably a branch of the portal vein, but this was secured by ligature. The pancreatic duct was sutured, and the pancreatic substance was brought together by two layers of catgut sutures. The slit in the gastro-hepatic omentum was sutured; the gall-bladder was drained, and a small split-drain passed down into the region of the incision in the duodenum, the rest of the wound being closed.

*After-History.*—The patient made a steady though slow recovery, and on April 30 I had a letter to say that the wound had healed completely at the end of seven weeks, and that the patient was able to be in the drawing-room. Twelve weeks after the operation she had an attack of pain associated with a temperature, this being repeated on one or two subsequent occasions, though nothing was discovered to account for it. On July 27 I had a letter to say: 'I am pleased to be able to give you a good report of your patient. From June 2 up to the present time there has been steady improvement, and the patient has been able to resume her household duties and to go out for drives.' November, 1903, said to be quite well.

*Gall-stones, Gastric Ulcer: Cholecystotomy; Excision of Ulcer; Gastro-enterostomy.*

CASE 488.—Mr. S., aged fifty-five, seen with Dr. McGregor Young, Leeds. (See p. 259.)

*Gall-stones: Cholecystotomy.*

CASE 489.—Mr. W., aged forty-five, seen with Dr. Robinson, Sunderland. For some years subject to severe attacks of biliary colic. No enlargement of the gall-bladder, but tenderness above and to the right of the umbilicus; no permanent jaundice.

*Operation.*—26/2/1903. Cholecystotomy; one large stone and

several small ones removed from the gall-bladder and cystic duct; drainage.

*After-History.*—Patient made a good recovery, and is now well.

*Cancer of Liver and Pancreas : Cholecystotomy.*

CASE 490.—Mr. H., aged forty-three, seen with Dr. Hosking, Turner's Hill. Twenty years ago the patient had typhoid fever. For six months had had attacks of abdominal pain, and in January jaundice appeared, and had persisted since. He had lost flesh lately, and was very ill and feeble. There was some enlargement of the right lobe of the liver, and distension of the gall-bladder, but no marked tenderness.

*Operation.*—5/3/1903. Cholecystotomy performed to relieve the jaundice due to cancer of the pancreas and liver.

*After-History.*—Patient recovered from the operation, and lived for two months.

*Gall-stones and Pyloric Stenosis : Cholecystotomy and Gastro-enterostomy.*

CASE 491.—Rebecca S., aged fifty, seen at the Leeds General Infirmary. Six months' history of attacks of pain and jaundice, and loss of flesh. Vomiting had been frequent, and at times large quantities were ejected. Patient was very ill and emaciated, and, besides a tumour in the hypochondrium, she had great dilatation of the stomach.

*Operation.*—9/3/1903. Gastro-enterostomy for pyloric stenosis, and cholecystotomy for removal of a large number of gall-stones.

*After-History.*—Patient recovered from the operation, and left the infirmary. Five weeks later she had an illness, said to be acute pneumonia, of which she died.

*Post-mortem.*—Empyema of the left pleura was found, with an abscess in the lung. The gastro-enterostomy was perfect, and the abdominal wound was soundly healed. The ducts and gall-bladder were clear of stones and healthy.

*Gall-stones in Hepatic and Common Ducts, Chronic Pancreatitis : Choledochotomy.*

CASE 492.—Mrs. D., aged fifty-nine, seen with Dr. Lawrie, Kilmarnock. Twenty-six years ago patient began to suffer from abdominal pain, followed by jaundice and vomiting; subject to attacks at longer or shorter intervals ever since. Fifteen years ago was in bed for three months, with constant pain. Never had rigors. A fortnight ago had a severe attack of pain, followed by jaundice, which persisted. Had lost 4 stones in weight. No enlargement of the liver or gall-bladder; some dilatation of the stomach. Pancreatic crystals found in urine.

*Operation.*—10/3/1903. Cholecystotomy; small gall-bladder, containing two stones, which were removed, and the gall-bladder drained. Common and hepatic ducts contained many stones, which were removed through an incision in the common duct; choledochotomy, with suture of the duct. Slightly swollen pancreas.

*After-History.*—Patient made a good recovery, and remains well.

*Cancer of Gall-bladder and Liver : Exploration.*

CASE 493.—Mrs. M., seen with Dr. Hodgson, Burnley. For six months had been suffering from painful indigestion, and during the last month had been losing flesh. Six weeks ago had a severe attack of abdominal pain, followed by jaundice; the pain had been constant since, and the jaundice had persisted and deepened. There had been slight shivering attacks on several occasions. Tenderness over the gall-bladder region elicited, with some swelling of the right border of the liver, feeling like a hard, nodular tumour.

*Operation.*—10/3/1903. Exploratory laparotomy; cancer of the gall-bladder, with cancer of the adjoining portion of the right lobe of the liver. Secondary growths felt in the portal fissure.

*After-History.*—Recovered from operation and returned home in three weeks.

*Deep Jaundice, Acute Cirrhosis of Liver : Exploration of Pancreas through Duodenum ; Drainage.*

CASE 494.—Georgina W., aged twenty-three, seen at the Leeds General Infirmary. Jaundice was first noticed eight months ago, and had persisted since with varying intensity. There had been no attacks of pain, but the patient had been extremely ill and feeble. She had occasionally been sick, and for the last fortnight had vomited almost every day directly after food. There had been no pain throughout. Patient extremely ill, and so feeble that operation was only done at the urgent request of the patient and her friends. Examination negative, except for some enlargement of the liver and spleen.

*Operation.*—17/3/1903. Exploratory operation; gall-bladder distended with bile, aspirated, opened, and drained. No stones found; tube stitched in. The ampulla of Vater was explored through an incision in the duodenum, as it was thought that something hard was obstructing the pancreatic duct, but nothing abnormal was found, except slight hardening of the pancreas. The opening in the duodenum was closed by sutures. The liver looked black and congested.

*After-History.*—During the night following operation the patient became collapsed and blanched. Hæmorrhage took place from

the tube in the gall-bladder, and from the stitch punctures. She gradually became weaker, and died the next day.

*Post mortem.*—Hæmorrhages found in the substances of the lungs, and about the root of the left lung. About 2 ounces of blood found in the peritoneal cavity. The spleen was slightly enlarged, the pancreas normal, (?) except for small areas of necrosis, probably post-mortem digestion. The liver showed bright yellow nodules on the surface and on section. Microscopically, there was active cirrhosis, with formation of much connective tissue. The nodules were areas where the liver cells had undergone necrosis. One pathologist suggested the condition was acute atrophy of the liver, another acute cirrhosis with pancreatitis.

*Cholecystitis, Residual Abscess, Chronic Pancreatitis: Cholecystectomy.*

CASE 495.—Mr. O., aged fifty-nine, seen with Dr. Le Rosignol, Jersey. A year ago had an attack of biliary colic, followed by numerous attacks since, the last two having been followed by jaundice. The liver was somewhat enlarged, and there was tenderness to the right of, and above, the umbilicus. No enlargement of the gall-bladder.

*Operation.*—26/3/1903. Extensive adhesions; swelling of head of pancreas; remnant of abscess between the gall-bladder and duodenum found, but no gall-stones; gall-bladder thickened and contracted; cholecystectomy; drainage of the cystic duct.

*After-History.*—Patient made a good recovery, and was able to return home in the fifth week.

*Gall-stones: Cholecystotomy.*

CASE 496.—John W. H., aged thirty-five, seen at the Leeds Infirmary. Six months' history of attacks of biliary colic, with occasional jaundice; no rigors; tenderness over the gall-bladder, but no tumour.

*Operation.*—31/3/1903. Cholecystotomy; a number of small stones removed.

*After-History.*—Patient made a good recovery, and continues well.

*Cancer of the Pancreas, Jaundice, Ascites: Cholecystotomy.*

CASE 497.—Dr. S., aged sixty-two, seen with Dr. Mason, Walton-on-Thames. Patient had been failing in health for three years, and had become anæmic through rectal hæmorrhage from piles. Six months previously he had a rigor, followed by jaundice, which persisted for six weeks, and then passed off. Two months previously the jaundice recurred without pain, and had persisted, it being associated with anorexia and great loss of flesh and

strength. There was an enlarged liver with a distended gall-bladder, but no tenderness over either. Slight ascites detected, and there was some œdema of the feet. Cancer of the pancreas diagnosed, but patient wishful to have an exploratory operation on the chance of getting even temporary relief.

*Operation.*—4/4/1903. Cholecystotomy; cancer of the head of the pancreas and ascites.

*After-History.*—The operation was well borne. A few hours later the patient had an attack of syncope, from which he rallied, but died twenty-four hours later from cardiac failure.

*Gall-stone in Hepatic Duct : Choledochotomy and Cholecystotomy.*

CASE 498.—Mrs. F., aged sixty-two, seen with Dr. Rayner, Stockport. Operation, April 15, 1903. Well, December, 1903.

*Gall-stones, Chronic Pancreatitis : Choledochotomy ; Cholecystectomy.*

CASE 499.—Mr. D., aged fifty-nine, seen with Dr. Roper, Leeds. Two years ago had an attack of jaundice with pain, but no gastrointestinal disturbance; enlargement of the liver and spleen. A year ago had a recurrence of the jaundice, with pain; these attacks had recurred frequently since, and during the last few months he had had shivering attacks, with pain and jaundice. Had lost 8 stones in weight during the last few years; six months ago patient had a strangulated inguinal hernia successfully treated by herniotomy. The liver was considerably enlarged; also some enlargement of the gall-bladder, with some tenderness. Fine pancreatic crystals in urine.

*Operation.*—14/4/1903. Liver enlarged and cirrhotic, and there were a large number of adhesions; a gall-stone the size of a pullet's egg was found in the gall-bladder; one the size of a rook's egg in the common duct removed by choledochotomy; the gall-bladder with the stone was removed by cholecystectomy; pancreas enlarged.

*After-History.*—Patient made a good recovery.

*Gall-stones : Cholecystotomy.*

CASE 500.—Mrs. W., aged thirty-five, seen with Dr. Dobie, Keighley. Two years ago had had attacks of pain over the liver, with vomiting; the two last attacks of pain had lasted for three or four days, and had been followed by jaundice and a feeling of chilliness; no distension of the gall-bladder.

*Operation.*—15/4/1903. Cholecystotomy; several stones removed from the cystic duct and gall-bladder.

*After-History.*—Patient made a good recovery.



*Gall-stones : Cholecystotomy.*

CASE 501.—Mrs. B., aged forty-four, seen with Dr. Dearden, Wyke, for attacks of pain starting in the epigastrium and passing through to the back. For two years patient had been losing flesh. No jaundice, but a slight icteric tinge after each attack; no enlargement of the gall-bladder, but considerable tenderness, and some enlargement of the liver.

*Operation.*—15/4/1903. Cholecystotomy; several gall-stones removed from a contracted gall-bladder.

*After-History.*—Good recovery.

*Gall-stones ; Chronic Pancreatitis : Choledochotomy and Cholecystotomy.*

CASE 502.—Miss C., aged forty-three, seen with Dr. Rayner, Stockport. For nine years had had attacks of biliary colic. The attacks lasted some hours, and were followed by slight jaundice, which had recently persisted. There had been considerable loss of flesh and general ill-health. Pancreatic crystals found in urine.

*Operation.*—22/4/1903. Cholecystotomy and choledochotomy; three stones removed from the gall-bladder and cystic duct, and one from the common duct by choledochotomy; duct sutured; right renal pouch drained; slight enlargement of pancreas.

*After-History.*—Good recovery; well, July, 1903.

*Gall-stones, Infective Cholangitis, Jaundice, Chronic Pancreatitis : Choledochotomy.*

CASE 503.—Mrs. S., aged thirty-four, seen with Dr. Johnston, Belper. Symptoms of gall-stones for four years; had been under treatment for ulcer of the stomach, but there had been no hæmatemesis. Four months previously jaundice came on after an attack of pain, since which time the attacks had been frequent and always followed by jaundice, rigors, and fever. On one occasion the gall-bladder was distended. When seen there was a slight tinge of jaundice. She had lost 3 stones in weight. There was an absence of enlargement of the liver or gall-bladder, but marked tenderness over the gall-bladder was elicited. Pancreatic crystals found in urine.

*Operation.*—23/4/1903. Choledochotomy; one large calculus removed from the cystic duct, and some smaller stones from the common duct, through separate incisions in the two ducts; common duct sutured; cystic duct drained; enlarged pancreas.

*After-History.*—Patient made a good recovery, and is now well.

*Ulceration and Perforation of Common Bile-duct by Gall-stone, Pancreatitis : Drainage of Duct ; Cholecystectomy.*

CASE 504.—Mrs. O., aged forty-two, seen with Dr. Williams, Wrexham. After gall-stone symptoms extending over some

months, the patient had an acute seizure, followed by an illness of some weeks' duration, associated with jaundice, fever, and rapid loss of flesh, there being decided tenderness and swelling in the gall-bladder region. Pancreatic crystals found in urine.

*Operation.*—27/4/1903. 'On opening the abdomen numerous adhesions were encountered, and on separating the superficial ones the space above the kidney, between it and the common duct, was found to contain pus and bile, and in the cavity was a large gall-stone the size of a blackbird's egg, which had ulcerated through the common duct, leading to extravasation of bile. During the separation of adhesions and removal of the damaged gall-bladder a large vessel was wounded, and ligatured with so much difficulty that it was felt safer to leave pressure-forceps on it by the side of the drainage-tube, and no attempt was made to close the ulcerated opening into the common duct. Drainage of the bile-duct and of the infected area was performed. There were numerous adhesions between the liver and diaphragm, where there had evidently been subdiaphragmatic peritonitis, thus preventing the liver being rotated, and making the operation extremely difficult. Pancreas difficult to palpate.

*After-History.*—The patient bore the operation badly, and succumbed to shock the following day.

*Gall-stone in Common Duct : Choledochotomy after Cholelithotrixy.*

CASE 505.—Mrs. S., aged sixty-eight, seen with Dr. Evelyn, York. For twelve years had suffered from attacks of biliary colic, followed by jaundice, which had lately been persistent; considerable loss of flesh. The liver was slightly enlarged; no enlargement of the gall-bladder.

*Operation.*—28/4/1903. Choledochotomy; one large stone removed from the common duct after the concretion had been crushed.

*After-History.*—Good recovery.

*Gall-stones, Chronic Pancreatitis : Cholecystotomy.*

CASE 506.—Mrs. T., aged fifty, seen with Dr. Callender and Mr. Meredith, London. For six years had had attacks of biliary colic, and during the last two months had had numerous seizures, followed by slight jaundice, fever, and collapse. Fine pancreatic crystals in urine.

*Operation.*—30/4/1903. Cholecystotomy; forty stones removed from the gall-bladder and cystic duct. Head of pancreas swollen.

*After-History.*—Good recovery; well, July, 1903.

*Cancer of Liver : Exploratory Operation.*

CASE 507.—Mrs. M., aged fifty-four, seen with Dr. Scatterty, Keighley. For two or three months the patient had had attacks

of pain in the region of the liver, and a tumour had lately been noticed. There was a distinct irregular mass under the right costal margin continuous with the liver and associated with a distended gall-bladder. Patient had lost flesh and looked very ill.

*Operation.*—14/5/1903. Exploratory; carcinoma of the liver and gall-bladder found.

*After-History.*—Recovered from operation, and returned home at end of three weeks apparently relieved.

*Biliary Pulmonary Fistula, Gall-stone impacted in the Hepatic Duct :  
Hepato-dochotomy.*

CASE 508.—Mr. G., aged twenty-eight, sent by Dr. Mathew, Port Elizabeth, South Africa. He was quite well up to April, 1894, when he had an attack of pneumonia; six months later he had an illness accompanied by a cough, and on the third day he began to expectorate; shortly afterwards he coughed up a large quantity of pus and bile. Before this attack he had had no liver symptoms, except that on one occasion he had had pain in the gall-bladder region, which it was surmised might be due to gall-stones. Since that time he had regularly coughed up bile and pus, and he was thought at first to be suffering from phthisis. He lost flesh rapidly and had night sweats. During the year before coming to England he had not got thinner, though the amount expectorated did not lessen. An examination of the chest showed no sign of lung disease, though the breath-sounds diminished on the right side up to the seventh rib. The liver was decidedly enlarged, and projected 3 inches below the costal margin. There was slight jaundice. About 1 to 1½ pints of extremely offensive bile and pus were coughed up in the twenty-four hours.

*Operation.*—21/5/1903. No cyst discovered in the liver, which showed signs of cirrhosis. After numerous firm adhesions had been separated, a gall-stone was found impacted in the hepatic duct, and removed through an incision in the duct; numerous adhesions fixed the back and the dome of the liver to the diaphragm, but no abscess cavity discovered; drainage of the hepatic duct was effected by a rubber catheter, and a gauze drain was passed to the neighbourhood of the incised duct. The expectoration of bile was immediately arrested, but offensive pus was coughed up. The expectoration of bile returned on the third day, and then gradually diminished; the cough became less, and the purulent expectoration rapidly diminished.

*After-History.*—Two months later the patient had improved very much, was gaining weight rapidly, and was only coughing up a small quantity of muco-pus, without any bile. There was

no jaundice, and all the bile was passing into the bowel. The wound had been soundly healed for a month, and he had been able to walk several miles a day. He returned to South Africa in the third month, and has since reported himself well.

*Gall-stones : Cholecystotomy.*

CASE 509.—Mrs. L., aged thirty-seven, seen with Dr. Gibson, Harrogate. For fifteen years the patient had suffered from attacks of biliary colic; lately the attacks had become extremely acute, and patient had been quite an invalid. The last attack was followed by jaundice, and the patient was still slightly jaundiced at time of operation. There was some enlargement of the liver, with acute tenderness over the gall-bladder.

*Operation.*—25/5/1903. Cholecystotomy; numerous stones removed from the gall-bladder and cystic duct.

*After-History.*—Patient made a good recovery, and is now well.

*Gall-stones : Choledochotomy.*

CASE 510.—Mrs. B., aged twenty-eight, sent by Sir Thomas Fitzgerald and Dr. Hooper, Melbourne, seen with Dr. J. Prince Bartlett, London. Gall-stone attacks for six years; lately the attacks had been severe and frequent, and there had been loss of flesh; the gall-bladder was distended and tender.

*Operation.*—4/6/1903. Cholecystotomy; two large gall-stones removed from the gall-bladder, with muco-pus, and one stone removed from the termination of the cystic duct by choledochotomy; duct sutured; gall-bladder drained.

*After-History.*—Patient made a good recovery, and is now well.

*Dilated Common Duct, Chronic Pancreatitis : Cholecystotomy ;  
Choledochostomy.*

CASE 511.—Miss F., aged twenty-eight, seen with Dr. Griffiths, Swansea. Four years previously she had typhoid fever, and had never been well since; a year previously she had an attack of pain followed by jaundice and some enlargement of the gall-bladder. She was operated on by Dr. Griffiths in June, 1902; no gall-stones were found, but the head of the pancreas was much enlarged. The gall-bladder was drained, and the wound healed within the month. The patient was well up to March, 1903, when she had a recurrence of the jaundice, with sickness, retching, and pain; she became very ill, and lost flesh rapidly. When we saw her together there was some enlargement of the gall-bladder, and a distinct cystic swelling over the pancreas. Pancreatic crystals found in urine.

*Operation.*—4/6/1903. Inflamed and distended gall-bladder; large cyst on the inner side of the gall-bladder containing bile and

pus—probably a dilated common bile-duct ; finger passed into the cyst reached behind the stomach and duodenum ; drainage of the gall-bladder and of the cyst.

*After-History.*—Patient made a good recovery from the operation and returned home, but it was not considered wise to leave out the tubes, and subsequently a further operation was necessary. (Case 526.)

*Gall-stones in Common Duct, Jaundice and Infective Cholangitis :  
Choledochotomy.*

CASE 512.—Mrs. T., aged sixty-six, seen with Dr. Waterhouse, Hampstead. For many years had been subject to attacks of biliary colic, with occasional fever and jaundice ; eighteen months' freedom until six weeks ago, when the attacks recurred, and were repeated very frequently, accompanied by rigors, jaundice, fever, and loss of flesh. When seen, the patient was very feeble and vomiting everything. After rectal feeding for a week the vomiting ceased, and the pulse improved somewhat.

*Operation.*—5/6/1903. Choledochotomy and cholecystotomy ; sixty-six gall-stones removed from the common and hepatic ducts, which were sutured.

*After-History.*—The patient made a good recovery, and was able to be on the sofa within the month ; now well.

*Gall-stones, Jaundice and Infective Cholangitis : Choledochotomy.*

CASE 513.—Mrs. S., aged sixty-four, seen with Dr. Whipham and Dr. Turner, London. Gall-stone symptoms for forty years, with ague-like attacks and slight jaundice ; stones regularly found in the stools after the attacks until three years ago. Lately the attacks had been more frequent, and were always followed by intensification of jaundice, and associated with rigors and loss of flesh and strength.

*Operation.*—5/6/1903. Thirty-five gall-stones, with pus and bile, removed from an inflamed gall-bladder, and three gall-stones removed from the common duct by choledochotomy ; duct sutured and gall-bladder drained ; very firm adhesions rendered the operation somewhat difficult.

*After-History.*—Patient made a good recovery, and is now well.

*Chronic Catarrhal Cholecystitis : Cholecystotomy ; Gastrolysis.*

CASE 514.—Mr. H., aged twenty-three, seen with Dr. Child, London. Had an attack of typhoid fever in South Africa four years ago, followed by pain and tenderness over the gall-bladder region ; symptoms of gall-stones three months ago, since which time there had been recurring attacks, with slight jaundice and

general ill-health (for which he had been invalided home from West Africa, in order to have an operation performed). Some tenderness over the gall-bladder, but no enlargement to be felt.

*Operation.*—6/6/1903. Cholecystotomy; no gall-stones found; extensive adhesions between the gall-bladder, omentum, stomach, and intestine separated; gall-bladder full of tenacious mucus and dark, thick bile, though a bacterial examination proved it to be sterile.

*After-History.*—Patient made a good recovery, and is now well.

*Gall-stones : Choledochotomy and Cholecystotomy.*

CASE 515.—Mrs. M., aged fifty-two, seen with Dr. G. S. Mill, Ossett. Frequent attacks of gall-stone pain for many years; lately the attacks had been followed by jaundice and vomiting; slight enlargement of the liver; no enlargement of the gall-bladder; no dilatation of the stomach.

*Operation.*—10/6/1903. Cholecystotomy and choledochotomy; one stone removed from the common duct, which was closed by sutures.

*After-History.*—Good recovery, and patient now well.

*Gall-stones in Common Duct, Jaundice and Infective Cholangitis, Cirrhosis of Liver, Chronic Pancreatitis : Choledochotomy.*

CASE 516.—Mr. E., aged forty-two, seen in London. Ague-like seizures and slight jaundice, with great loss of flesh; very little pain, though some pain always preceded the shivers, and then the jaundice became deeper; bulky, frequent stools, containing fat and undigested muscle; urine contained pancreatic crystals, but no sugar or albumin.

*Operation.*—19/6/1903. Choledochotomy; several gall-stones crushed in the common duct, and removed by the scoop through an opening in the duct; the gall-bladder and common duct were drained; the pancreas was much enlarged (chronic pancreatitis); liver cirrhotic. There was considerable oozing of blood from the wound from the sixth to the eighth days, arrested by calcii chlorid. in large doses.

*After-History.*—The patient made a good recovery, and left the surgical home with the wound healed. It subsequently reopened and discharged bile; weight has been gained, and he is decidedly better, though not well. December 18, Mr. E. called to say that the fistula had closed on November 17, and that he had gained 2 stones 6 pounds since the operation.

*Gall-stones : Cholecystotomy.*

CASE 517.—Miss W., aged forty-three, seen with Dr. Clayton, Hampstead. In September, 1900, the patient had an attack of

pain in the right side, followed by jaundice. During the next four months she had several attacks, and a loss of  $1\frac{1}{2}$  stones in weight. She was free from acute seizures until March, 1902, when she had a similar severe attack. The attacks had been frequent and severe since, and were followed by jaundice.

*Operation.*—25/6/1903. Enlargement of the right lobe of the liver; gall-bladder thickened, containing nine gall-stones and muco-pus; cholecystotomy.

*After-History.*—Patient made a good recovery, and is now well.

*Gall-stones, Ulcerative Cholecystitis, Abscess of Liver: Cholecystectomy.*

CASE 518.—John E., aged sixty-seven, seen at the Leeds Infirmary. For forty years had had attacks of indigestion; six months before admission had a severe attack of biliary colic, followed by jaundice, itching, and clay-coloured motions. The attacks had been frequent since. No jaundice on admission.

*Operation.*—30/6/1903. Many adhesions found; ulcerative cholecystitis; three stones removed from gall-bladder; gall-bladder dissected away from the liver. An abscess found in substance of liver evacuated, curetted, and packed with gauze.

*After-History.*—Patient made a good recovery, and remains well.

*Gall-stones, Suppurative Cholangitis, Parotitis, and Septicæmia: Choledochotomy.*

CASE 519.—Mrs. L., aged sixty-five, seen with Sir William Broadbent and Dr. Bousfield. Patient extremely ill, deeply jaundiced, and in a state of septicæmia, with daily rigors, high fever, and acute parotitis on the left side. There was also mitral disease and slight albuminuria. This acute condition had come on within the past fortnight, though the patient gave a history of gall-stone attacks for years.

*Operation.*—10/7/1903. The common duct was enormously dilated, and on incision a quantity of extremely offensive pus and bile was discharged; this poured out of the ducts in the liver. Three large gall-stones, the size of rook's eggs, were removed from the common duct, and a number of small ones, the duct itself being drained; the gall-bladder was quite small. After completing the operation, the parotid was incised and drained.

*After-History.*—The operation was well borne, and the next morning the patient had a normal temperature, and expressed herself as doing well. At lunch-time of the following day she appeared to be doing well, when suddenly the heart became embarrassed, and she died rapidly, before any help could be summoned, probably from thrombosis. An examination by Mr. Eastes

of the purulent bile removed at the time of operation showed it to contain the *Bacillus coli communis* in large numbers; next in numbers were streptococci, and another rather fine bacillus, which appeared to grow anaerobically only, and there was a spore-bearing organism, probably the *Bacillus coli putrifacies*.

*Gall-stones, Perceptible Tumour of Gall-bladder : Cholecystotomy.*

CASE 520.—Mrs. R., aged seventy-two, seen with Dr. Donald Hood and Dr. Bartlett, of London, and Dr. Greaves, of Bournemouth, on account of a tumour in the gall-bladder region. There had been a history of gall-stone attacks fourteen years and seven years ago, since which time, beyond a little uneasiness in the gall-bladder region, there had been no pain until a recent attack in Bournemouth. As the tumour was increasing, operation was advised.

*Operation.*—14/7/1903. Cholecystotomy; thirty-four gall-stones were removed from the gall-bladder, one being the size of a walnut.

*After-History.*—Patient made a good recovery; well, November, 1903.

*Cancer of Gall-bladder and Liver : Laparotomy.*

CASE 521.—Mrs. W., aged forty, seen with Dr. McNeil, of Bridlington, on account of a tumour on the right of the abdomen. The patient had complained of pain for some months, and had noticed a swelling, though she had not mentioned this to Dr. McNeil until a week before I saw her. There was a trace of albumin in the urine, and a question as to the presence of slight ascites. The tumour was nodular and hard.

*Operation.*—21/7/1903. Exploratory operation was performed, when malignant disease of the gall-bladder was found, associated with secondary nodules in the liver and slight ascites. The abdomen was closed, nothing further being done.

*After-History.*—Patient recovered from the operation.

*Cancer of Ampulla of Vater with Pancreatitis (?)*.

CASE 522.—Mr. B., aged thirty-seven, seen with Dr. Thomson, Lincoln, on account of extremely rapid loss of weight (4 stones) and strength, associated with very deep jaundice. There was no history of paroxysmal pain, though he had been liable to curious epigastric distress, which he described as indigestion. The liver was enormous in size, and reached to the anterior superior spine of the ileum. The enlarged gall-bladder could be easily felt, and a doubtful ascitic wave. The motions contained fat and muscle



fibre, but no bile, the stools being bulky and pale, and occurring two or three times every day.

*Operation.*—23/7/1903. Cholecystotomy was performed in order to try to give relief to the jaundice. There were some adhesions along the cystic duct, and there was a distinct swelling of the pancreas, with definite hardness at one point, as if there might be growth starting in the ampulla of Vater and invading the pancreas. No stones could be felt. The bile that drained away was intensely dark, but by the third day it had cleared very materially, and, at the same time, his colour was improving. The wound healed by first intention; the tube came away on the seventh day, and the bile continued to drain into the dressings. On the evening of the seventh day he had what he called his indigestion pain, which appeared to be cardiac, though the pulse remained quite normal and regular. On the morning of the eighth day, immediately after he had been seen by my colleague, Mr. Armour, who had taken the pulse and found it 80, he suddenly became collapsed, and died within ten minutes, apparently from heart failure. Unfortunately, a post-mortem could not be obtained.

The bowels had been moved quite satisfactorily each day, and the bile was gradually returning in the motions. An examination of the urine by Mr. Cammidge showed pancreatic crystals, not pointing to malignant disease; but whether it was chronic pancreatitis secondary to cancer of the ampulla of Vater, or cancer of the head of the pancreas, must, unfortunately, remain doubtful in the absence of an autopsy which could not be obtained.

*Gall-stones in Gall-bladder and Common Duct : Cholecystotomy and Choledochotomy ; Duodenal Fistula repaired.*

CASE 523.—Miss H., aged fifty, seen with Dr. Haines, London, and Dr. Ashley Cummins, Cork, on September 14, 1903. Twenty years' history of occasional attacks of gall-stones. For the last four years the attacks had been more frequent, and since Christmas jaundice had never completely passed away, though in the interval it was quite slight. In the early months of the year the seizures were always accompanied by ague-like attacks, which had been more marked lately. Swelling in the right lobe of the liver; rigid rectus; marked tenderness; slight jaundice.

*Operation.*—25/9/1903. Two gall-stones removed from the gall-bladder, which was inflamed and thickened, and two by choledochotomy from a dilated common duct, which was sutured, the opening in the gall-bladder being used for drainage. A minute gall-bladder duodenal fistula was discovered, and the opening in the duodenum was closed by a purse-string suture.

*After-History.*—Good recovery. Patient quite well, November, 1903.

*Cancer of Pancreas and Liver : Exploratory Operation.*

CASE 524.—Mr. M., aged fifty-one, seen with Dr. Roughton, New Barnet, September 12, 1903, suffering from jaundice and three abdominal fistulæ in the epigastrium and right hypochondrium, two of which were discharging bile and pus, and which were the result of previous operations, in which an abscess had been evacuated and some gall-stones removed from the gall-bladder. There had been great loss of flesh and some fever, the illness having continued from Christmas, 1901, though the jaundice had only been present since the last operation, two months before. An examination of the fæces by Dr. P. J. Cammidge showed an excess of fat and muscle fibre. The urine did not contain any albumin or sugar, but numbers of pancreatic crystals soluble in from four to five minutes, therefore pointing to malignant disease. As the patient was suffering from irregular fever, with attacks of pain suggestive of concretion in the common duct, and manifestly running down, and as he was anxious to see if the obstruction in the common duct could be relieved, a further operation was undertaken.

*Operation.*—3/10/1903. Well-marked malignant disease of the pancreas and liver was found. The abdomen was therefore closed.

*After-History.*—Recovery from operation. In December he was gradually losing ground, though still hopeful of recovery.

*Gall-stones, Kinking of Bile-ducts by Movable Kidney, Pyloric Stenosis : Cholecystotomy ; Gastrolysis ; Pylorodiosis ; Nephropexy.*

CASE 525.—Mrs. F., aged sixty, seen with Dr. Orr, Putney, September 2, 1903. Twelve years ago she passed gall-stones, and had on one or two occasions since had attacks of pain, after which gall-stones had been discovered in the motions, though she had never been jaundiced. A year ago she began to suffer from paroxysmal pain in the gall-bladder region, since when there had been great loss of flesh and at times slight jaundice. When I saw her there was tenderness over the gall-bladder region, marked dilatation of the stomach, and an easily-movable tumour, which we diagnosed as a floating kidney. Exercise brought on pain, so that the patient was confined to the bed or sofa, and looked extremely ill and thin.

*Operation.*—10/10/1903. The tumour proved to be a floating kidney, with a tendency to hydronephrosis. The gall-bladder was enlarged, and contained thick bile and mucus. It was evidently dragged on by the kidney so as to produce kinking of the bile-ducts. The pylorus was contracted and adherent to the gall-bladder. The adhesions were separated, and the pylorus dilated

by Hahn's operation. Cholecystotomy was performed, and afterwards nephropexy.

*After-History.*—Good recovery. Patient well, December, 1903.

*Chronic Pancreatitis, Dilated Common Bile-duct, Cholecystitis :  
Cholecystectomy ; Choledochenterostomy.*

CASE 526.—Miss F., aged twenty-eight, seen with Dr. Griffiths, Swansea. Since the former operation there had continued to drain away from the tube in the dilated common bile-duct 20 to 30 ounces of bile. No bile entered the bowel, and from the tube leading into the gall-bladder 4 to 6 ounces of clear mucus drained away each day. The patient was thin and feeble, had no appetite for food, and was unable to digest anything beyond a little milk. An examination of the urine showed the absence of albumin and sugar, but the presence of pancreatic crystals, which dissolved in from three-quarters to one minute. The fæces contained fat and muscle fibre. An examination of the bile by Dr. Eastes was reported to contain numerous bacilli, which proved to be the *B. enteritidis* of Gartner.

*Operation.*—8/10/1903. Head of pancreas found to be enlarged, but no concretion was felt in it or in the common bile-duct. Gall-bladder completely excised, the cystic duct being ligatured; the dilated common bile-duct was then connected to the duodenum by means of a decalcified bone bobbin, and the wound was closed. The same evening the patient expressed herself as feeling hungry for the first time since her illness, this apparently being dependent on the bile and pancreatic fluid entering the intestine. She straightway began to absorb whatever nourishment was taken, had her bowels moved on the second day, gained strength, resumed her natural colour, and made such a rapid convalescence that she returned home within the month, having gained 7 pounds in weight since the operation.

*Gall-stones, Chronic Pancreatitis : Choledochotomy ; Cholecystotomy.*

CASE 527.—Mrs. C., aged forty-six, seen with Dr. Tate, Highgate, September 29, 1903. Symptoms of gall-stones for two years. Six months ago had a severe attack of pain followed by jaundice, which lasted for six weeks, and slight jaundice had continued. Since that time had had several shivering attacks, and had lost 3 stones in weight.

*Operation.*—14/10/1903. Riedel's lobe well developed; adhesions very numerous; shrunken gall-bladder discovered containing no gall-stones; head of pancreas enlarged, and hardness felt behind it. Common duct opened, and scoop passed down the ampulla of Vater, from which a gall-stone the size of a haricot bean was

removed. After this a probe readily passed into the duodenum. The common duct sutured, gall-bladder drained.

*After-History.*—Uninterrupted recovery. Patient up at the end of three weeks. Well, December, 1903.

*Cancer of Gall-bladder and Liver : Hepatectomy and Cholecystectomy.*

CASE 528.—Mrs. R., aged fifty-seven, seen with Dr. Gregor, Penryn, Cornwall. The patient, who had had a cholecystotomy for gall-stones February 26, 1902 (Case 422), said that she had been quite well up to two months ago, except for pain over the gall-bladder. She had had none of the old attacks, but on one occasion there had been a slight ague-like seizure. On examination, a tender lump could be felt in the gall-bladder region. As the patient had pain on movement which necessitated her resting, and as her general health was failing, an operation was advised.

*Operation.*—19/10/1903. The gall-bladder was found the size of a small hen's egg, full of solid material. On incising it, the swelling was found to be new growth, which was infiltrating the contiguous parts of the liver. The gall-bladder and adjoining part of the liver were removed by a wedge-shaped incision. The cystic duct was divided and ligatured well beyond the disease. The bleeding from the cut liver surface was isolated by means of continuous catgut sutures; the stump of the cystic duct was covered with omentum. A small drain was inserted, which was removed on the second day. The wound healed by first intention, and the patient left the surgical home at the end of three weeks.

*Chronic Pancreatitis : Cholecystenterostomy.*

CASE 529.—Mrs. W., aged fifty-seven, seen with Dr. Roxburgh, Troon. The patient had had two operations previously in Glasgow. On the occasion of the first operation in September, 1902, a number of gall-stones were removed from the gall-bladder, which was drained, but since the wound had healed the attacks had been repeated as before. A second operation was undertaken by the same surgeon without finding anything definite. After the wound had healed the attacks again returned, and the subsequent history up to the time of my seeing her was that she had almost daily attacks of pain, followed by slight jaundice, and on five or six occasions, usually at intervals of a month, she had had violent seizures necessitating hypodermic injections of morphia. About five weeks ago the pain was so violent as to cause her to faint, and just before coming to London another violent seizure, accom-

panied by collapse, occurred. A rigor followed each attack, the temperature rising nightly to 101° F. or 102° F. She was rapidly losing flesh and strength. An examination by Dr. Cammidge showed no albumin or sugar, but well-marked pancreatic crystals, which dissolved in from one to one and a half minutes, rendering the diagnosis of chronic pancreatitis pretty certain.

*Operation.* — 20/10/1903. Adhesions were most extensive. There was well-marked enlargement and hardness of the pancreas along its whole length, but it was not nodular. The common duct was carefully examined, but found to be free of concretions, and on opening the gall-bladder a probe was passed through it, and the cystic and common ducts, into the duodenum. While the probe was in position the pancreas was manipulated, and found to compress the duct, thus accounting for the obstruction. Cholecystenterostomy was therefore performed, the union being effected to the colon by means of a decalcified bone bobbin. At the time of operation the gall-bladder was separated from the liver in order to make it reach the bowel without tension. For a few days after operation bile was discharged from the torn liver surface in free quantities, but there was no leakage from the newly-joined viscera. As the bile obtained a free passage into the bowel it gradually ceased being discharged from the liver, and the tube was able to be left out at the end of ten days. The wound healed by first intention, and the patient was up at the end of three weeks. She was then able to take and digest her food, and has since been quite free from her old attacks.

*Cirrhosis of Liver, Deep Jaundice, Enlarged Pancreas, Tumour of Portal Fissure (? malignant): Cholecystotomy.*

CASE 530.—Mr. C., aged fifty, seen with Dr. Southern, Derby. Had had doubtful attacks of painful indigestion during the past few years, but no definite attack till Christmas, 1902, when he was seized with a dull pain in the epigastrium, accompanied by shivering, and followed by jaundice, which persisted. During the interval he had steadily lost flesh and strength, and had had a number of similar attacks. At the beginning of October a severe rigor, followed by a temperature of 102° F. and an intensification of the jaundice, left him very much enfeebled. An examination showed some tenderness in the gall-bladder region, but no muscular rigidity and no tumour could be felt. He was then deeply jaundiced and very ill. An examination of the fæces showed no undigested fat or muscle fibre; only 1 per cent. of fat by weight being present. The urine showed no sugar or albumin, and, curiously, no bile pigments. Some pancreatic crystals were discovered, which were rather long in dissolving.

*Operation.*—23/10/1903. Well-marked cirrhosis of the liver discovered. A large vein the size of the brachial seen in broad ligament of liver; hard nodular tumour discovered in portal fissure close to the Spigelian lobe; pancreas considerably enlarged and hard over the whole length, and embracing common bile-duct. No gall-stones found; gall-bladder distended with bile. On opening the gall-bladder, a probe could be passed through the common duct into the duodenum. Cholecystotomy performed for drainage. Adhesions between gall-bladder, colon, and duodenum divided. Omentum fixed to abdominal wall to encourage collateral circulation. The omental fat was indurated and unhealthy, and there was a question as to spots of fat necrosis. The operation was badly borne, and the pulse was very feeble towards the end of it; afterwards there was free oozing of blood, which was stopped by the administration of chloride of calcium in repeated doses. Subsequently the patient made poor progress, and though there was no distension or other signs of peritonitis, and no elevation of temperature, he gradually got weaker, and died four days later. Unfortunately, no autopsy could be obtained.

*Gall-stone in Common Duct : Choledochotomy.*

CASE 531.—Mr. S., aged sixty-five, seen with Dr. Finch Haines, Highgate. For two years had been subject to occasional attacks of epigastric pain. In January, 1903, a severe attack was followed by jaundice, since which time he had rapidly lost weight, and the jaundice had never disappeared. Pain after food had been a marked feature. He had never vomited blood or had melæna. There was no dilatation of the stomach, and no evidence of tumour. The recti were rigid. He was seen by a physician, who diagnosed cancer of the pancreas. An examination of the urine by Dr. Cammidge showed an entire absence of pancreatic crystals.

*Operation.*—24/10/1903. Gall-stone the size of a filbert discovered in common duct, and removed through an incision which was afterwards sutured. Gall-bladder drained.

*After-History.*—Recovery uninterrupted. Patient now well.

*Suppurating Hydatid discharging into Bile-ducts, Infective Cholangitis, Chronic Pancreatitis : Cholecystenterostomy.*

CASE 532.—Mr. K., aged twenty-six, residing at Bedford, Cape Colony, was sent to me by Dr. Ross, October 26, 1903. He gave a history of gall-stone attacks for five or six years, each attack having been followed by jaundice. On April 15 an operation was performed on him in Cape Colony, when a cholecystotomy was done and some gall-stones were removed. The operation was a very difficult one, on account of adhesions, and lasted three hours.

He, however, made a good recovery ; but on July 1 he had another severe attack of pain followed by jaundice, which had persisted. The liver was much enlarged, and an abscess was suspected, as he became very feverish, the temperature every night being 103° F., though normal in the morning. He had numerous shivering attacks, and constant pain and tenderness. On August 14, after an unusually severe seizure, he was extremely ill, and was said to have congestion of the middle lobe of the liver. In July and later small translucent sacs, bile-stained and containing water, were noticed in the motions, together with masses of mucus, leaving very little doubt that hydatid cysts were being discharged from the bile passages. He improved somewhat on the voyage, but when he arrived in England he looked extremely ill, was deeply jaundiced, and very feeble. An examination of the fæces was made by Dr. Cammidge, who reported : fat 4 to 5 per cent. by weight, but no muscle fibres or fat globules found. The urine showed crowds of pancreatic crystals soluble in half to one minute, but there was an absence of sugar or albumin. On examining the abdomen, the liver was found to be much enlarged, and there was marked tenderness at the epigastrium.

*Operation.*—2/11/1903. Liver, gall-bladder, and other viscera adherent to surface of abdomen, so that on section it was most difficult to find the peritoneal cavity. After a short time the viscera were defined, the gall-bladder isolated, and the pancreas and common bile-duct palpated. The pancreas was found to be very much enlarged and thickened, and to be compressing the common duct. The glands all along the duct were enlarged and hard, and about the size of filberts—some larger. On the centre of the under surface of the liver was an indurated area, as if there might have been an abscess or hydatid cyst there, which had emptied itself, but no fluctuation could be detected and no bogginess. As bile was in the gall-bladder under some tension, and no gall-stone could be felt in the common duct, the gall-bladder was connected to the duodenum by means of a Murphy's button.

*After-History.*—The patient bore the operation well, and made an uninterrupted recovery. He was able to leave for the seaside within the month and is now quite well.

*Gall-stones in Common Duct, Chronic Pancreatitis : Choledochotomy.*

CASE 533.—Mr. H., aged fifty-seven, seen with Dr. Mitchell, Guildford. The patient had resided for years in India, where he suffered from fever and had a greatly enlarged spleen. There was a history of loss of flesh for some months, and a sudden onset of pain associated with fever and followed by jaundice in

July, 1903. Ague organisms were found in the blood at that time. From that time onward he had been extremely ill and had lost flesh very rapidly. In the interval there had been several attacks of pain. When I saw him there was jaundice, though not very intense. The spleen was enlarged nearly to the umbilicus, and the liver reached to the same level. The gall-bladder was enlarged, but not tender, and there was no rigidity of the recti. His pulse was feeble, intermittent, and slow. The case did not seem at all a favourable one for operation, but it was decided to have the urine examined, when pancreatic crystals were discovered, dissolving in one minute and leading to the diagnosis of chronic pancreatitis. Pankreon tabloids were prescribed with general treatment, under which some improvement occurred, and when I saw him again I thought him decidedly better. The liver was less in size but the spleen could be felt considerably enlarged.

*Operation.*—5/11/1903. The liver was found to be enlarged, dark, and granular, as if in the first stage of cirrhosis. Firm adhesions of the omentum to the gall-bladder were ligatured off and some of them separated. The gall-bladder itself was shrunken and practically obliterated. A rounded gall-stone the size of a small walnut was discovered in the common duct, from which it was removed through an incision which was sutured. A probe readily passed into the duodenum. The pancreas was considerably enlarged and pressed on to the common duct, but did not embrace it. It was, therefore, not felt necessary to drain the common duct.

*After-History.*—No shock followed the operation, and a week later the wound had closed, except for a small sinus where the drain had been. He completely lost his jaundice and returned home well in five weeks.

#### *Chronic Pancreatitis, Jaundice : Cholecystotomy.*

CASE 534.—Mrs. J., aged forty-two, seen with Dr. Harold. History of jaundice for three years with loss of 2 stones in weight. She had been subject to painful indigestion, but gave no history of colic or severe pain. Itching of the skin was a prominent feature. As the patient was very thin, it was easy to palpate the epigastrium, and a swelling could be felt in the region of the pancreas, with well-marked tenderness. The liver was very little enlarged and not hard. Pancreatic crystals were found in the urine, dissolving in half a minute, and muscle fibres with 3 per cent. of fat in the motions, rendering the diagnosis of chronic pancreatitis pretty certain.

*Operation.*—4/11/1903. Gall-bladder small, the common duct somewhat dilated; the duodenum and colon both adherent to the liver, and separated with difficulty. The head of the pancreas



was found to be enlarged, and a large accessory pancreas was seen in front of the common bile-duct. Another lobe was felt behind the common bile-duct. At first these were taken to be very large lymph glands, but on a more careful examination they proved to be pancreatic tissue, apparently pressing on the common duct. No gall-stones discovered. Cholecystotomy performed for drainage of the ducts.

*After-History.*—Good recovery from operation, but returned home on the fifth week wearing the tube, as when it was left out the jaundice returned and with it intense pruritus. Doing well, Jan., 1904.

*Kinking of Common Bile-duct due to Adhesions, Catarrh of the Pancreas and Gall-bladder : Cholecystotomy.*

CASE 535.—Dr. B., aged thirty-nine, seen with Dr. Armstrong, Buxton. Had suffered from indigestion for years, but had the first severe attack of biliary colic in July, 1899, when gall-stones were passed, since which time the attacks had been frequent, and recently much more acute, frequently necessitating the use of morphia; a slight icteric tinge accompanied the attacks. Pancreatic crystals found in urine.

*Operation.*—23/11/1903. A thickened gall-bladder was found, the walls being much hypertrophied and adherent to the adjoining organs. A specially firm band extended from the middle of the common duct to the under surface of the liver, producing a well-marked kink of the duct. The cystic duct was pouched. No gall-stones were discovered. The gall-bladder was drained of a quantity of thick dark bile and mucus.

*After-History.*—Good recovery.

*Gall-stones, Catarrh of the Gall-bladder : Cholecystotomy.*

CASE 536.—Mrs. C., aged forty, seen with Dr. Atkinson, Hornsey. The patient had complained of pain over the right side of the abdomen for some months, though a tumour had only lately been noticed under the right costal margin. There was well-marked tenderness and constant pain, though there had been no severe spasmodic attacks.

*Operation.*—25/11/1903. The gall-bladder was found distended to the size of a goose's egg, the walls being inflamed and thickened. On incising it, a quantity of muco-pus escaped, and two gall stones the size of a small walnut were removed from the cystic duct. The gall-bladder was drained.

*After-History.*—The patient made a good recovery.

*Compression of Cystic Duct by Hydatid Tumour of Liver : Drainage.*

CASE 537.—Mr. V., aged thirty-nine, seen with Dr. Styan, Ramsgate. He had complained of pain over the gall-bladder for

several years, though there had been no severe paroxysmal attacks. A tumour had been recently noticed under the right costal margin. The swelling was tender to pressure, and was situated a little internal to the usual position for a gall-bladder.

*Operation.*—26/11/1903. On opening the abdomen, the gall-bladder was found thickened and distended, the cystic duct being compressed by a tumour projecting from the under surface of the left lobe of the liver, which on incision was found to contain about half a pint of pus, small hydatid cysts, and débris of larger ones. This was thoroughly emptied and cleansed, but as bile began to flow freely a drainage-tube was inserted. As there appeared to be no other obstruction of the bile-ducts, the gall-bladder was not drained.

*After-History.*—Good recovery.

*Obstructed Common Bile-duct, Interstitial Pancreatitis :  
Cholecystenterostomy.*

CASE 538.\*—F. B., aged fifty-nine, sequence of Case 468. He recovered from the operation of cholecystotomy and improved very markedly, gaining flesh and strength, but whenever the fistula closed he became jaundiced and had symptoms of infective cholangitis in the shape of ague-like attacks, and after each attack he lost rapidly in weight and strength. He was very desirous, therefore, to have a further operation done.

*Operation.*—6/7/1903. The gall-bladder was detached from adhesions and made to communicate by means of a Murphy's button with the intestine. He took the anæsthetic badly, and had a curious attack, with twitching of the limbs, which was probably dependent on apoplexy, for his breathing became altered and his pulse slow and feeble. Oxygen was given for ten hours, but he never rallied. In consequence of his serious condition during anæsthesia the ducts could not be thoroughly explored, though a swelling could be felt beneath a mass of adherent viscera. At the autopsy a gall-stone was found in the common duct, and a microscopic examination of the pancreas by Dr. Cammidge showed a small-celled infiltration between the lobules of the pancreas.

*Perigastritis following Cholelithiasis, suspected recurrence of Gall-stones : Gastrolysis.*

CASE 539.\*—Mrs. M. Z., aged thirty-six, 'spasms' for twenty years. Cholecystotomy in Durban, Natal, ten months ago. Four

\* Cases 538 and 539 should be on pages 461 and 357 respectively. The omission not being discovered until too late to give it the proper order among the cases.

gall-stones removed. After healing of wound, in five weeks return of pain. Pain always after food, and at times vomiting; never vomited blood. Losing flesh rapidly. Dilatation of the stomach. No tenderness over gall-bladder.

*Operation.*—6/7/1897. Adhesions between pylorus and gall-bladder and liver broken down, and omentum interposed. Bile ducts explored, no gall-stones found.

*After-History.*—July 6, 1898, patient writes: 'I now feel a different person and enjoy perfect health.' 1902, quite well. Normal weight regained.

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